Science





Primary 6

First Term

Name: ---

Class: ---



Content



Unit One

Mass and Weight

Neil, I have lost so much of my mass since coming to Space

Buzz Your Mass is the same You've lost one sixth from your weight on the earth.



Mass and Weight

Lesson One



First: Mass

Discover the concept of mass





-In these figures; the mass of 10 bananas is larger than the mass of 9 bananas, so the mass of bananas depends on its amount.

> The mass of an object increases when the amount of matter in it increases and vice versa

-In these figures; the mass of two eggs is equal to the mass of the searchlight.





G.R: The mass of the two eggs equals the mass of one searchlight.

Because both the eggs and the searchlight contain the same amount of matter.



The Mass:



The amount of matter in an object

- The mass of any matter is fixed (stable) and does not change by changing the place of matter.

Mass Measuring Units:

1.	**Gram (g)**	-It is used for measuring small masses such as jewellery ***-It is equal to the mass of a paper clip.***
2.	**Kilogram (Kg)**	-It is suitable for measuring large masses such as fruits and vegetables. ***-It is equal to the mass of one liter of distilled water.***



Measuring Tools of mass:

-Mass is measured by different types of scales as:

Two arm Balance Scale	Two arm Sensitive Balance
	
One arm Balance with a Pointer	One arm Digital balance
	

Activity 1

How do we measure the mass of a solid object by using a balance?

The mass of any solid object equals the total mass of the standard masses.



- **Standard Masses**: Pieces of metal with known masses.



The two pans of a balance are equal **when they have the same mass.**





How do we measure the mass of a liquid by using a digital scale?





The mass of liquid =mass of the glass with liquid - mass of the empty glass



Mass = $m_2 - m_1$

Does mass differ from one place to another?





By measuring the mass of an object on the earth's surface, then measure the mass of the same object on the moon's surface,

We will notice that **its mass is not changed.**

Second: Weight

Discover the concept of weight





What makes objects fall downwards the earth's surface?

There is a **force** that pulls these objects down, this force is called **weight.**

The Weight

It is the force of attraction of an object, directed downwards to the center of the Earth

Or

It is the gravity force that pulls down the object

On earth, all objects have weight, but in space all objects have no weight (weightless)

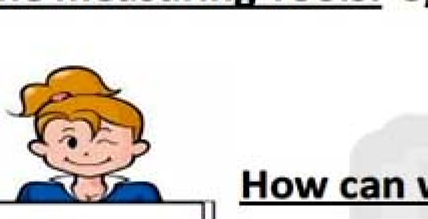


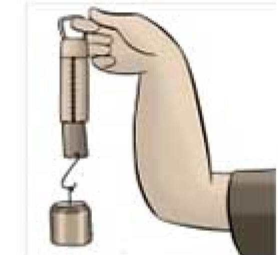
W = Mass **x** 10

The Measuring Unit of weight:

Newton	1 Newton = 100 gram Newton is almost equal to the weight of an object whose mass is 100 grams.

The measuring Tools: ***Spring Scale***





How can we measure weight?

Observation:

-The object, hang in the spring scale, pulls the spring downwards and the reading of the pointer increases.

Conclusion:

*The weight of any object can be measured by the spring scale by determining the extension of its spring.

(G.R): **The weight is a changing (variable) property of an object.**

Because the weight of an object depends on the gravity force which differs from a place to another.

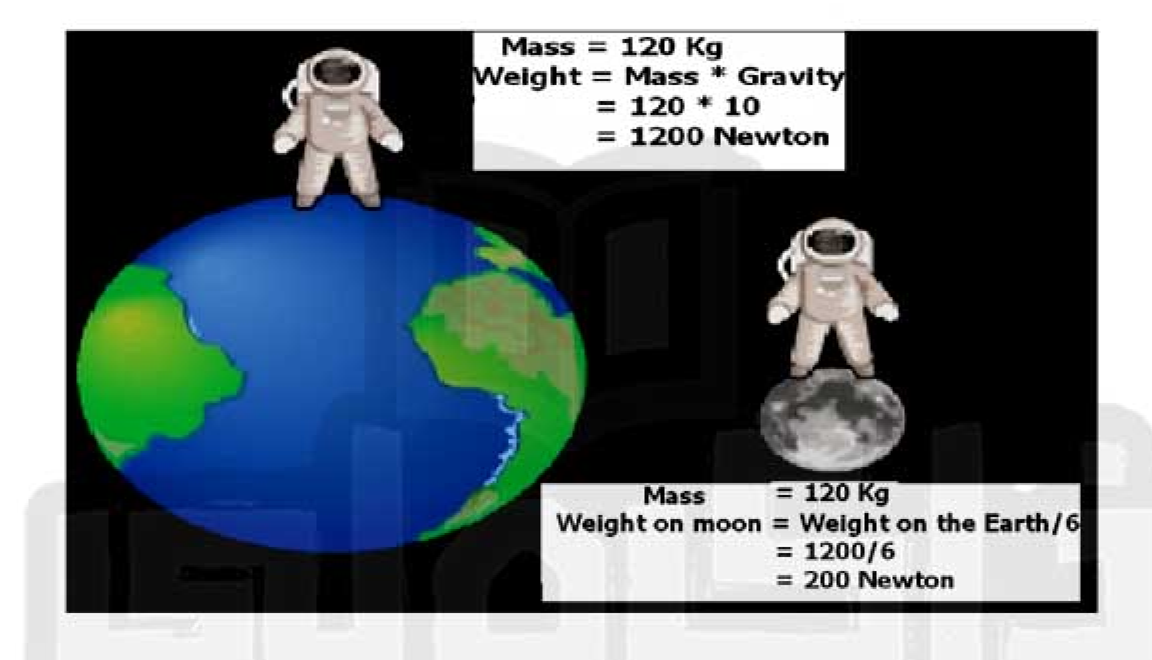
- **The weight on the moon equals 1/6 the weight on the Earth.**





The factors affecting weight

1. The object's mass.
2. The place (planet) where the object exists.
3. Distance between the object and the center of the earth.



The Factors affecting Weight

1. The Mass of an object:

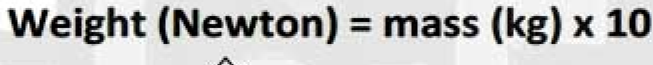
➢ As the mass of an object increases, the weight increases.

Activity: Discover the relation between mass and weight.

The object's mass (kg)	1	2	3	4	5
The object's weight(Newton)	10	20	30	40	50

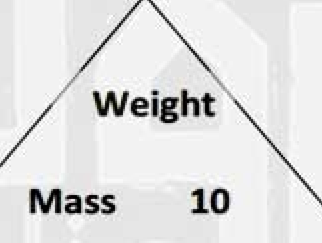
Observation:

The weight of any object on the earth's surface increases by increasing the object's mass.

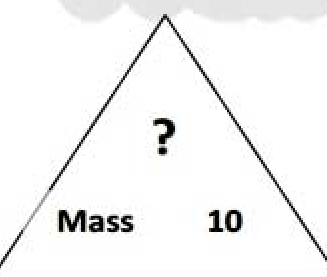


Weight (Newton) = mass (kg) x 10

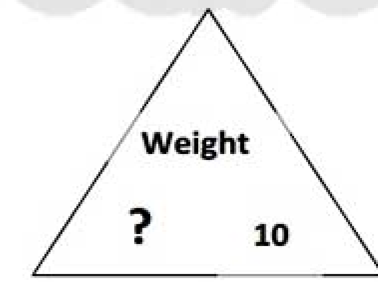




To find weight:



To find mass:





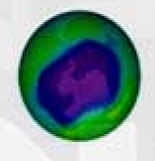
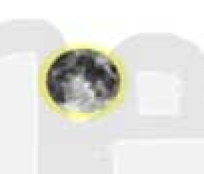
Example: **Calculate the mass of an object that its weight equals 90 Newton.**

Mass = Weight / 10

Mass = 90 / 10 = 9 Newton

2. The place (planet) on which the object exists:

- As the mass of the planet increases, the gravitational force increases and so the weight increases.
- -On measuring the weight of an object on the earth's surface then measure the weight of the same object on the moon's surface
- We notice that **its weight changes.**

		
Jupiter >Earth>Moon Jupiter's mass > Earth's mass > Moon's mass **Weight on Jupiter > Weight on Earth > Weight on Moon**		

The weight of the objects on the moon's surface equals one sixth (1/6) of its weight on the earth's surface

Example: Calculating the weight of an object using its known mass:

An object has a mass of 30 kg. Calculate:

1. The mass on the moon's surface
2. The weight on the Earth's surface
3. The weight on the moon's surface

Solution:

1. **The mass on the moon's surface** = mass on the moon = 30 Kg.

2. **The weight on the Earth's surface** = mass × 10

   = 30 × 10 = 300 Newton

3. **The Weight on the moon's surface** = weight on Earth x 1 / 6

   = 300 x 1/ 6 = 50 N

Give reason for :

The weight of a person on the earth's surface is larger than that on the moon's surface



Because the mass of earth is larger than that of the moon and as the mass of planet increases, the gravitational force for an object increases, so its weight increases.

3. The distance from center of the Earth:

- As the distance between the object and the center of the Earth **increases**, the gravitational force **decreases**, and so the weight of object **decreases.**
- The larger the distance, the weaker the gravity.
- **Example:**

The Mountain Large distance	Low gravity. **Less Weight**.
The Valley Small distance	High gravity. **More Weight**.

G.R: The weight of a person in a balloon is smaller than that on the earth's surface .



Comparison between mass and weight:

Point of comparison	**Mass**	**Weight**
Definition	The amount of matter in an object.	The force with which a body is attracted to earth.
Unit of measurement	Kilogram or gram	Newton
Device of measurement	Balance scale	Spring scale
Direction	Has no direction	It is towards the center of the earth
Effect of places	Constant (does not by changing place	Variable (changes from place to another)

Exercise on unit one

Complete the following:

1) -------------is the amount of matter in an object

2) The object's mass is constant and it is not affected by changing-------------

3) ----------------unit is suitable for measuring jewels, while ---------------unit is suitable for measuring vegetables.

4) An object with mass 6 kg equals -----------grams.

5) The mass of an object ---------------when the amount of matter increases in it.

6) Mass is measured by different types of scales as --------------and------------

7) The measurement unit mass is -----------or ----------- whereas the measurement unit of weight is-------------

8) Mass is measured by --------------whereas weight is measured by -------------

9) The attraction force of the earth to the body is called ----------------

10) The effect of weight is always directed towards -------------------

11) An object's weight depends on------------------

12) When the mass of a small ball is 400 grams, so its weight equals-------------

13) Mass is measured by --------------- scale whereas weight is measured by ------------------ scale.

14) The factors affecting the weight of the body depends on ----------------------- , ----------------------------- and --------------------------

15)Mass of any object = -----------/ 10

16)The gravitational force by which a body is attracted to earth is called --------

17) The weight of an object on the moon's surface equals------------- of its weight on the earth's surface.

18) As the mass of the planet increases, the weight of an object exists on this planet will ------------------ because the gravitational force of this planet -----------------

19)The weight of an object on the earth's surface equals ------------ times its weight on the moon's surface.

20)The mass of the body on earth is --------------- whereas its weight on earth is -----------------

21)The weight of the body on earth's surface increases as the –---------------- increases.

22)As the mass of the planet on which the body exists increases, the-------------- of the body increases

Choose the correct answer:

1) The device of measuring weight is--------

a. one-arm scale b. two-arm scale c. digital scale d. spring scale

2) From the measuring units of weight---------

a. gram b. liter c. Newton d. kilogram

3) --------equals the mass of one paper clip.

a. Kilogram b. Gram c. Newton d. Ton

4) ---------is suitable for measuring large masses as fruits and vegetables.

a. Kilogram b. Gram c. Ton d. Meter

5) The mass of half liter of water equals -------grams.

a. 5 b. 50 c.500 d.5000



6) All the following scales are examples of scales that are used to measure mass only except--------

a. balance scale
b. one-arm digital scale
c. Spring scale
d. sensitive two-arm scale

7) ---------is the amount of matter in an object.

a. Mass b. Weight c. Newton d. Gram

8) --------equals the mass of one liter of distilled water at the normal temperature.

a. Kilometer b. Kilogram c. Ton d. Meter

9) The mass of a body on the moon's surface is 10 kg, so its mass on earth's surface......

a. 10 kg b. 10 Newton c. 60 kg d. 60 Newton

10) --------is the gravitational force with which a body is attracted to earth.

a. Weight b. Mass c. Newton d. Balance scale

11) ---------is the measuring unit of weight.

a. Newton b. Meter c. Kilogram d. Gram

12) Newton equals the weight of an object whose mass is -----gram(s)

a. 1 b. 10 c. 100 d. 1000

13) -----------is the measuring device of weight.

a. The spring scale
b. The balance scale
c. One-arm scale
d. Two-arm scale

14)The weight of any object equals----------

a. its mass b. mass x 100 c. its mass x 10 d. mass/100



15)An object whose weight is 20 Newton on earth, so its mass equals-------

a. 10 kg b. 2 kg c. 200 kg d.20 kg

16) When the weight of a bag on the moon's surface equal 2 Newton, so its weight on the earth's surface equals -------Newton.

a. 12 b. 9 c. 20 d. 10

17) The weight of any object--------when the distance between the body and the center of the earth increases

a. Increases b. Decreases c. still constant d. (a) & (b)

18) Your weight on the earth's surface is 600 Newton, so your weight on the moon's surface is --------------- Newton.

a. 6 b. 60 c. 100 d. 10

19) If the body weight on earth surface equals 6 Newton, its weight on moon surface equals-------Newton.

a. ½ b. 1 c. 10 d. 1/6

20)The mass of a body on the moon surface is 10 kg so its mass on earth surface equals-------

a. 10 kg b. 10 Newton c. 60 kg d. 60 Newton

21) The Newton is nearly equals weight of a body its mass is-------

a. 11 gm b. 10 gm c. 100 gm d. 1000 gm

22)By increasing the distance between a person and earth, --------

a. the gravitational force for this person increases.
b. the gravitational force of this person decreases.
c. the weight of the person decreases.
d. (b) and (c)



23) The weight of a person in a balloon at certain height from earth surface equals 70 Newton, what is the weight of the person on earth's surface?
a. 68 Newton b. 79 Newton c. 70 Newton d. 71 Newton

Write the scientific term:

1. The amount of matter in an object (...........................)
2. The measuring unit of mass which equals the mass of one paper clip (..........)
3. A device used to measure the mass of objects (........................)
13)A type of scales that is used to measure the large masses as cheese and fruits (..............................)
14)The measuring unit of mass which equals the mass of one liter of distilled water (........................)
6. The measuring unit of mass which is suitable for measuring small masses like jewellery (........................)
7. The force with which a body is attracted to the Earth (...................)
8. A tool used to measure body weight (.........................)

Compare between:

Point of comparison	Mass	Weight
1. Definition		
2. Measuring Units		
3. Measuring devices		
4. Direction		
5. Effect of different places		



Give reason:

1. The mass of a body on the earth's surface equals the mass of the same body on the moon's surface.

----

2. The balance scale should be placed horizontally on a stable shelf.

----

3. Objects falling downward earth.

----

4. The weight of a person on the earth's surface is larger than that on the moon's surface.

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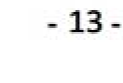
5. The weight of a body in a balloon is smaller than that on earth.

----

6. The weight of an object changes according to the planet where objects exist.

----

7. The wire of spring scale expands when a body is hanged to it.





What happens when:

1. The mass of the planet where the object exists increases.

----

2. The mass of an object decreases to half.

----

3. There is no gravity on the earth's surface.

----

4. You hang an object in the bottom hook of a spring scale.

----

5. You measure the weight of a toy car on the earth's surface, then measure its weight on the moon's surface.

----

6. You measure the mass of a toy car on the earth's surface, and then measure its mass on the moon's surface.

----

7. The distance between a person in a balloon and the center of earth increases.

Problems:

1) The mass of a bag on the earth's surface equals 6 kg. Calculate its mass on the moon's surface.

----

2) Calculate the weight of a book on the moon's surface, where its weight on earth's surface is 3 Newton.



3) Calculate the mass of a cat whose weight is 50 Newton.

----

4) If the object's mass = 30 kg on earth, calculate :

a. It's mass on the moon.

b. It's mass on the earth.

c. It's weight on the moon.

----

5) If the mass of a cup containing juice equals 240 grams, using a digital scale, and the mass of the empty cup equals 90 grams, calculate the mass of the juice.

Good Luck!

Unit Two

Thermal Energy

Heat Conduction

Lesson One:

Heat: it is a form of energy that transfers from the object with higher temperature to the object with lower temperature.

Heat energy flows from the hot object to the cold object,
This explains the following:

*When you touch a glass of hot water or tea you will feel the heat.(G.R)
Because heat transfers from the higher temperature object (hot glass) to lower temperature object (your hands).

*When you touch piece of ice you feel cold. (G.R)
Because of heat transfers from your hand to the piece of ice.

- **Importance of heat in our daily life:**

1. Cooking food
2. Heating Water
3. Drying the washed clothes
4. Warming houses



- **Importance of heat in Industry:**

Manufacture of glass and paper.







The Temperature: it is the degree of hotness or coldness of the body

- The measuring device of temperature is "the thermometer."
- The measuring unit of temperature is "the degree."

For example, your body temperature is **37C°** (37 Celsius deg



Find out the good and bad conductors of heat.



Observation:

The button falls from the metal spoon.

Conclusion:

The different materials such as plastic, wood and aluminium differ in conducting heat.



To show the ability of elements to conduct heat



Observation :

1. You feel hot when touching aluminium and iron rods.
2. You do not feel hot when touching wood and plastic rods.

Conclusion :

Material differ in conducting heat and are classified into two types :

1. **Good conductors of heat.** 2. **Bad conductors of heat(insulators)**



Uses of Conductors	Uses of Insulators
1. Making cooking pans and Utensils. 2. Making kettles.	1. Making the Handles of Cooking pans and kettles. 2. Making Heavy blankets and Woolen clothes 3. Making the insulating windows (They have a space filled with air between the two glass sheets.)

Using Aluminum in making cooking pans (G.R)

Because they are good conductor of heat that allow heat to flow through.

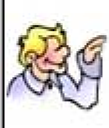
Using Plastic or wood in making handles of Utensils (G.R)

Because they are heat insulator that don't allow heat to flow through so they are safe while carrying hot utensils.

Using Wool and Insulator in making heavy blankets (G.R)

Because they are heat insulator so they keep the body warm in winter as they prevent leakage of heat.






To show that different kinds of Metals differ in their conductivity.



Observation:

The pin (a) falls first, then pin (b) and then pin (c)

Conclusion:

Different metals differ in conducting heat, where:

Copper conducts heat faster than aluminium.

Aluminium conducts heat faster than iron.

***(G.R): Leaving spaces between railway bars.**

Because **iron** bars **expand and twist by heat** and the spaces **prevent train accidents**.

***(G.R): Air is used in making insulating glass windows.**

Because air is heat insulator that prevent leakage of heat.

Points of comparison	Heat conductors	Heat insulators
Definition	They are the materials that allow heat to flow through	They are materials that do not allow heat to flow through
Examples	-Copper, aluminium, iron and stainless steel	-Glass, wood, paper, wool, air, liquids and rubber
Uses	-They are used in making : a) Cooking pans(utensils) b) Kettles	a)They are used in making the handles of : Cooking utensils, iron and kettles. b)Used in making heavy blankets and woolen clothes.



Exercises on lesson One

- **Complete the following:**

1. Heat is a form of-----------------------Which is transferred from
   -----------------------object to -----------------------object.
2. While catching a cup of tea with your hand the heat energy transferred from ------------------------to-------------------------
3. If are carrying a piece of ice the heat energy d transferred from
   ----------------------to------------------------
4. Heat energy is used in many industries such as------------and-------------
5. A device used to measure temperature is -------------------------
6. Materials such as plastic, rubber, air, water and wood are called
   ----
7. ----------- is a form of energy that that transfers from higher temperature object to lower temperature object.
8. -------- conducts heat faster than aluminium.
9. ---------------, ---------------and ------------- are good conductors of heat.
10. ------------------ is the degree of hotness or coldness of a body.
11. ---------------, ---------------and ------------- are bad conductors of heat.
12. Usages of bad conductors of heat are---------------------, -----------------
    and------------------------
13. Air is used in making ------------------- as it is an insulator.
14. Plastic is----------------conductor of heat, while copper is---------------
    conductor of heat.
15. -------------and------------are used in making handles of cooking pots.

16. Usages of good conductors of heat are---------------------, ------------------ and-------------------------

17. ----------------is used in making heavy blankets that keep the body warm.

- **Choose the correct answer:**

1. Heat transfers from---------

a) A hot object to an object that has the same temperature

b) A cold object to a hot object

c) A hot object to a cold object.

d) A cold object to an object that has the same temperature.

2. When you touch a piece of ice, the heat transfers---------

a) From hand to ice.

b) From ice to hand.

c) From hand to air to ice.

d) From air to ice.

3. -------- is a form of energy that transfers from the higher temperature object to the lower temperature object.

a) Temperature b) Newton c) Thermometer d) Heat

4. The degree of hotness or coldness of a body is called--------

a) temperature b) heat c)heat conductor d) heat insulator

5. Which of the following devices is the measuring device of temperature?

a) Recorder b) Thermometer c) Barometer d) Scale

6. ---------is a good conductor of heat.

a) Plastic b) Copper c) Wood d) Glass



7. --------- is a bad conductor of heat.
a) Copper b) Glass c) Aluminium d) Iron

8. All the following are good conductors of heat except--------
a) aluminium and iron b) copper and iron
c) Glass and wood d) aluminium and copper

9. Air is used in making the insulating glass windows as it-------
a) Is a heat conductor b) is a heat insulator
c) Prevents the leakage of heat d) b and c

10. Copper--------
a) does not allow heat to flow through
b) allows heat to flow through
c) is a heat insulator
d) all the previous answer

11. Aluminium conducts heat better than--------
a) iron b) glass c) wood d) a, b and c

12. Which of the following is faster in conducting heat?
a) Copper b) Iron c) Aluminium d) Glass

13. Insulators are used in making--------
a) heavy blankets and woollen clothes
b)handles of cooking pots
c) cooking utensils
d) (a) and (b)



- **Scientific term:**

1. A form of energy transfer from object with high temperature degree to object low temperature degree	(………………………)
2. Degree of hotness or coldness of the body	(………………………)
3. Materials allow heat energy to pass through	(………………………)
4. Materials do not allow heat energy to pass through	(………………………)
5. A device used to measure temperature degree	(………………………)

- **Give Reason:**

1. Using Aluminum in making cooking pans

----

2. Leaving spaces between railway bars

----

3. Using Wool in making heavy blankets

----

4. When you touch a glass of hot water or tea you will feel the heat

----

----

5. The insulating glass window has a space filled with air

----

6. When you touch a piece of ice you feel cold

----

7. Copper, iron and aluminium are good conductors of heat.

----

8. Wood, glass and plastic are bad conductors of heat (insulators).

----

9. Cooking pots are made of aluminium.

----

10. The handles of cooking utensils are made of plastic or wood.

----

11. Woolen clothes are used in winter.

- **What happens when:**

1. You hold a piece of ice in your hand.

----

2. You touch one end of a copper rod, while the other end is exposed to a flame.



3.The handles of kettles and cooking utensils are made of stainless steel.

----

4. You touch one end of a glass rod, while the other end is exposed to a flame.

- **Compare between the following:**

Point of comparison	Heat	Temperature
Definition:	------------------------------------ ------------------------------------	------------------------------------ ------------------------------------

Point of comparison	Good conductors of heat	Bad conductors of heat
Definition:	------------------------------------ ------------------------------------	------------------------------------ ------------------------------------
Examples:	------------------------------------ ------------------------------------	------------------------------------ ------------------------------------



Lesson Two

Measuring Temperature

⇒ Measuring temperature is important in our daily life, it helps us to:

1. Know the temperature of the weather to take precautions about our life skills
2. Know the temperature of our body to check our health conditions
3. Carry out some food industries which require a certain temperature

Thermometer:

A device used to measure the temperature.

How the thermometer works?



The idea of working the thermometer is to change the volume of the liquid by changing its temperature. **(G.R)**

(becauseThe liquid expands by heating and contract by cooling.)





To show how does the thermometer work:

Observation:

The level of the liquid in the straw rises up in case of hot water and falls down in case of iced water.

Conclusion:

Liquids expand by heating and contract by cooling

Types of thermometer:

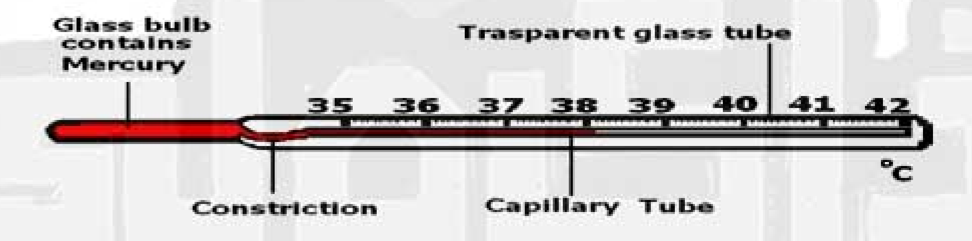
There are many types of thermometers, and these are the most common.

- **Types of Thermometers**
  - **Medical Thermometer**: Used for measuring the temperature of human body
  - **Celsius Thermometer**: Used for measuring the temperature of liquids



Medical Thermometer

The structure of the medical thermometer:



1. **A transparent glass tube:** Includes capillary tube closed from one end.
2. **A bulb filled with mercury:** Connected to the other end of the capillary tube.
3. **A Constriction:** exists above the bulb **(G.R)**, this prevents the mercury from dropping down quickly; to make a longer time for reading the temperature.
4. **A thermometer scale:** This starts from **35°C to 42°C,** and every degree is divided into ten parts.



The use of the medical thermometer:

→ For measuring the temperature of human body (37 °C, and goes up in sickness)



→ Digital thermometer is used mostly for children, so it can't be broken easily in their mouths.

Important Notice

The normal body temperature of healthy person is 37°C and it may go up during sickness.

How to use the medical thermometer to measure your body temperature?

1. **Sterilize** the medical thermometer using **ethyl alcohol**.
2. Dry the thermometer very well using paper tissue.
3. Shake the thermometer well until mercury goes back to the bulb.
4. Put the thermometer under your tongue for 1 minute.

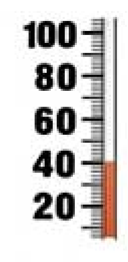
Remember!

Don't seize the thermometer firmly with your teeth in order not to be broken **because mercury is toxic.**

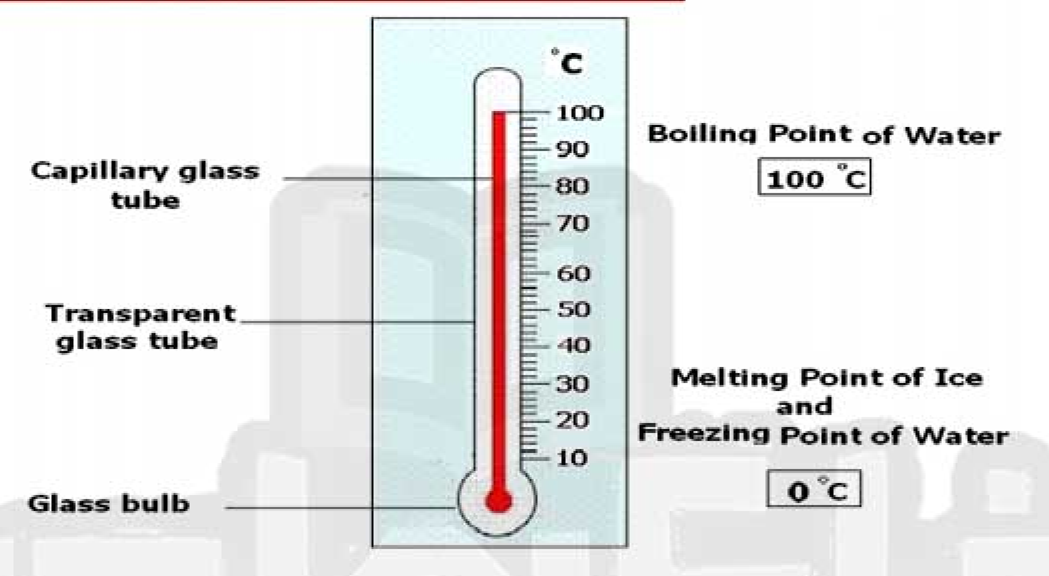




Celsius Thermometer



The structure of the Celsius thermometer:



1. **A transparent glass tube:** Includes capillary tube closed from one end.
2. **A bulb filled with mercury:** Connected to the other end of the capillary tube with no constrictions.
3. **A thermometer scale:** This starts from **0 °C to 100 °C**, and every degree is divided into ten parts.



In the Celsius thermometer, there is no constriction above the mercury bulb.



The use of the medical thermometer:

→ For measuring the temperature of liquid

⇒Using of Mercury in Making Thermometers. (G.R)

1. Mercury is a good conductor of heat.
2. Mercury is a liquid metal (has a luster and shiny) so, it can be seen easily through the glass thermometer.
3. Mercury does not stick to the wall of the capillary glass tube.
4. Mercury is a regular expanding material, so it gives an accurate reading.
5. Mercury remains liquid between two degrees temperature -39°C and 307°C and this gives a wide range to temperature measurement.



○ **In Celsius thermometer:**

0 °C is known as the **melting point of ice.**

100 °C is known as the **boiling point of water.**

Some thermometers contain two scales, one represents **Celsius scale (°C)** and the other represents **Fahrenheit scale (°F)**



0 °C = 32 °F

100 °C = 212 °F





To show that the Celsius thermometer is used in measuring the temperature of liquid:

Observation:







Mercury level stops at 80 ^{0}C	Mercury level stops at 50 ^{0}C	Mercury level stops at 40 ^{0}C

Conclusion:

The Celsius thermometer is used in measuring the temperature of liquids.



-While recording the temperature, the thermometer must be vertical and the direction of sight must be perpendicular to the thermometer.



Comparison between Celsius thermometer and medical thermometer

Point of comparison	Celsius thermometer	Medical thermometer
Structure:	a. Transparent glass tube. b. Capillary tube closed from one of its ends. c. Mercury bulb filled with mercury and connected to the other end of capillary tube.	
Constriction:	Absent	Present
Range of scale:	From 0 ^{0}C to 100 ^{0}C	From 35 ^{0}C to 42 ^{0}C
Liquid used:	Mercury	Mercury
Usage:	It is used to measure the temperature of liquids.	It is used to measure the temperature of human body.





Exercise on lesson Two

- **Complete the following:**

1. Measuring temperature helps in many processes such as…………….
2. The……………………is a device used to measure the temperature.
3. The idea of operation of the thermometer depends on the change of ……………………………by changing its…………………………..
4. There are two types of thermometer, they are……………………………and……………………………
5. The medical thermometer is used to measure the temperature of …………………………and it scale starts in……….and ends in……….
6. The medical thermometer has a/an……………………………… that prevents the mercury to drop down.
7. The normal temperature of the human body is…………and rises up in sickness
8. The Celsius thermometer and the medical one contain ……………………in the glass bulb
9. Celsius thermometer used to measure the temperature of ……………
10. Celsius thermometer scale starts in …………and ends in …………
11. Liquids…………………by heating and…………………by cooling.
12. …………………and…………………are two types of thermometers.
13. There is a constriction in the………………………thermometer.
14. The medical thermometer is characterized by the presence of…………………………above the mercury bulb.



15.We use……………………to sterilize the thermometer.

16.The Celsius thermometer is used in…………………………whereas the medical thermometer is used in…………………………………

17.The boiling point of water is…………while the melting point of ice is…………

- **Scientific term:**

1. A device used to measure the temperature	(…………………………)
2. A thermometer is used to measure the human body temperature	(…………………………)
3. A liquid used in making thermometers	(…………………………)
4. A curve in the start in the medical thermometer, which make a longer time for reading the temperature	(…………………………)
5. A device used to measure temperature of the different liquids	(…………………………)
6. The boiling point of water	(…………………………)
7. The melting point of ice	(…………………………)

- **Choose the correct answer:**

1............. is used to measure the body temperature.

a. Celsius thermometer
b. Medical thermometer
c. Thermostat
d. (a) and (b)

2. The medical thermometer is characterized than the Celsius thermometer by the presence of a...............

a. mercury bulb
b. Constriction
c. capillary tube
d. Scale

3. The bulb of the medical thermometer is filled with..........

a. alcohol
b. water
c. mercury
d. air

4. The maximum and minimum graduation of the medical thermometer is between.................

a. 370C to 42oC
b. 350C to 400C
c. 35oto 420C
d. 300C to 500C

5. The temperature of liquids is measured by using.............

a. Celsius thermometer
b. medical thermometer
c. thermostat
d. (a) and (b)

6. The melting point of ice is.........

a. 0 °C
b. 100 °C
c. 37 °C
d. 42 °C

7. Celsius thermometer is used to measure the...........

a. patient's temperature
b. boiling point of water
c. melting point of ice
d. (b) and (c)



8. Medical thermometer is different from Celsius thermometer in..........

a. the type of matter present in the glass bulb.

b. the presence of constriction in the capillary tube.

c. the type of matter used in manufacturing.

d. the effect of changing temperature on the present liquid volume.

9. When the temperature of mercury increases, its volume............

a. increases regularly and contracts.

b. decreases gradually and expands.

c. decreases gradually and contracts.

d. increases gradually and expands.

10. Before using the medical thermometer, we should shake it to......

a. sterilize it.

b. force the mercury back into the bulb.

c. clean it from dust.

d. move the mercury to the top of the thermometer.

- **Complete the following Comparison:**

	Medical thermometer	**Celsius thermometer**
Uses:	....	....
Structure:	....	....



- **What happens if:**

1. There is no constriction in the medical thermometer.

....

....

2. Water is used instead of mercury in making thermometers.

....

....

3. We do not shake the medical thermometer well before use.

....

....

4. The medical thermometer is not sterilized before use.

....

....

- **Give Reason:**

1. Measuring temperature is important in our life.

....

....

2. Mercury is used in making thermometers.

....

....

3. There is a constriction in the medical thermometer.

....

....

4. The idea of making thermometer depends on changing the volume of the liquid by changing the temperature.

....

....

5. We must shake the medical thermometer well before use.

....

....

6. The medical thermometer must be put in ethyl alcohol before use.

....

....

7. The thermometer must be kept out of the reach of children.

....

....

8. Celsius thermometer cannot be used to measure the human body temperature.

....

....

9. The medical thermometer is not suitable for measuring the liquid temperature.

....

....



Look at the following figure, then answer the questions:

1. Mention the type of thermometer shown in the figure.

……………………………………………………………………………

2. Mention the use of this thermometer.

……………………………………………………………………………

3. This thermometer is graduated from…………to………..

4.What is the function of part (1)?

……………………………………………………………………………

5. What is the name of part (2)?

……………………………………………………………………………





Unit Three

The Atmosphere





Lesson One: Oxygen

Atmosphere: it is a mixture of gases surrounding the earth.

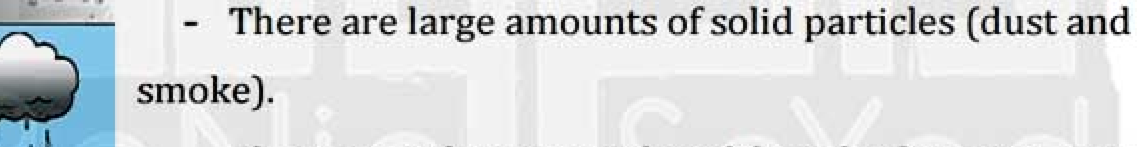
The atmosphere is attracted to the earth by gravity.

❖ **The importance of the atmosphere (G.R)**



1. Protect the Earth from the ultraviolet radiation coming from outer space.
2. Adjusts the temperature of the Earth's surface.





NOTE

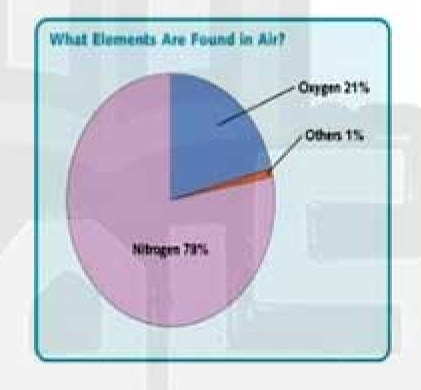
- There are large amounts of solid particles (dust and smoke).
- These particles are produced from by factories, cars and ships as air pollutants.
- These solid particles cause the condensation of water vapor in the air and falling of rain and snow.





The Atmosphere Components

Gas	Ratio	
Oxygen gas	▪ It forms **21 %** of air volume.	
Nitrogen gas	▪ It forms **78 %** of air volume.	
Other gases	▪ It forms **1 %**	- Carbon dioxide gas
		- Inert gases: as (Helium - Neon - Argon)
		- Water Vapour

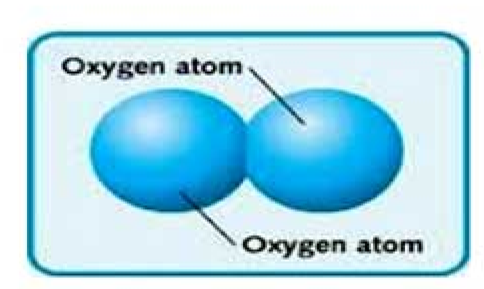




Oxygen

Structure of Oxygen:

- Oxygen exists in a gaseous state.
- Oxygen molecule consists of two oxygen atoms (O2).





- Oxygen has a fixed ratio (**21 %** OR **1/5 of the amount of air**), it doesn't change. **(G.R)**

Because the green plants produce oxygen in photosynthesis process to compensate the oxygen consumed during respiration and combustion processes.

Important!!!

- Green plants are the main source of Oxygen. **(G.R)**

Because it is produced during the photosynthesis process.

What is the source of oxygen?

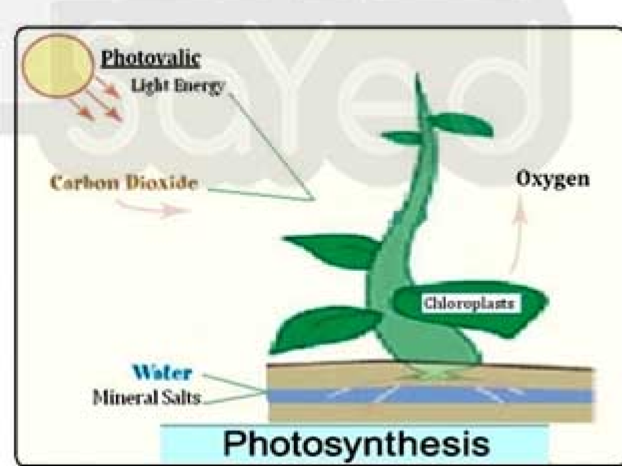
- **Green plants** are the main source of oxygen.
- It is consumed in **respiration and combustion processes.**

How does the plant make the oxygen?

- Green plants have **chloroplasts** in which the photosynthesis process occurs.
- **Photosynthesis Process:**

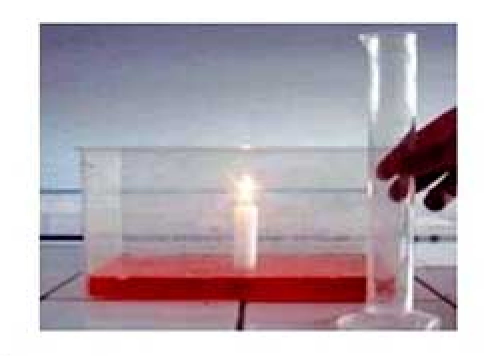
Absorbing of

- Water and mineral salts from soil.
- Carbon dioxide from the air.
- Sunlight.



Activity: To calculate the percentage of oxygen in air:

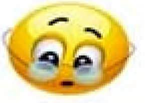
Observation:



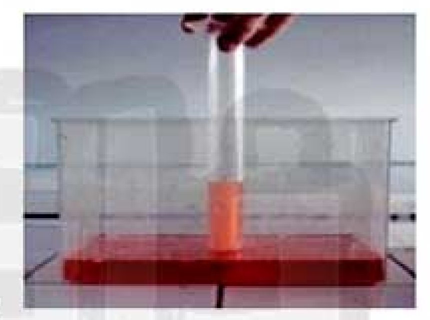
-The lighted candle extinguishes and water rises inside the cylinder with one fifth of its volume.

Conclusion:

-Oxygen occupies one fifth (21%) of the air volume.



Explanation:



-Air inside the cylinder loses one of its components which is oxygen, as it is consumed by the candle during burning.

-The consumed oxygen is replaced by water inside the cylinder.

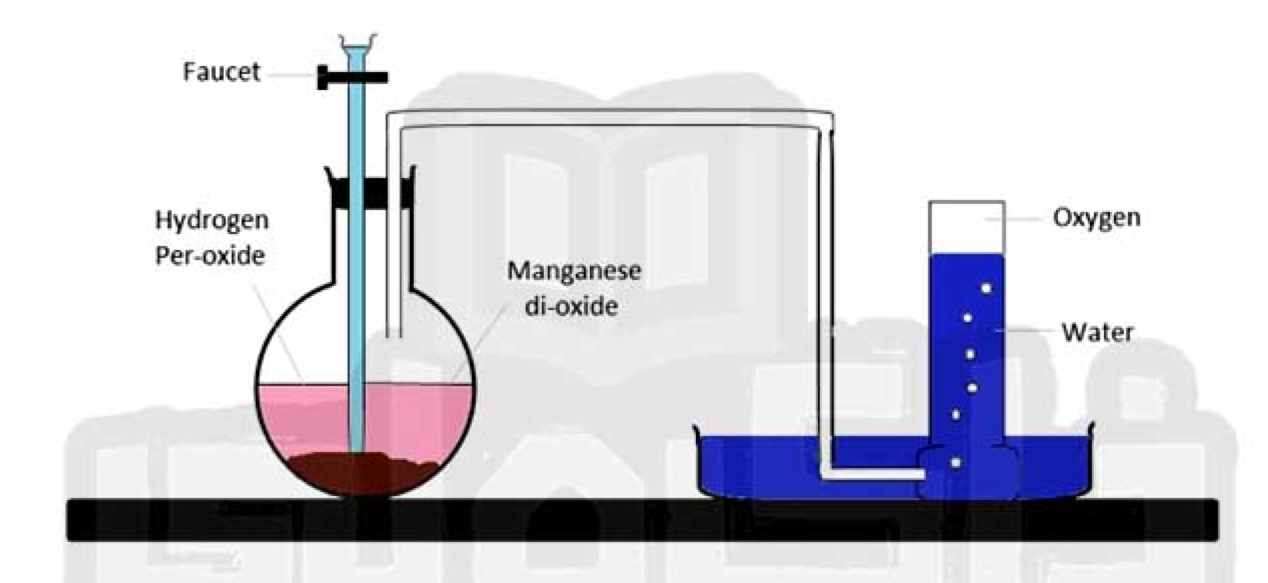




Preparation of Oxygen:

- Oxygen is prepared in laboratory by the decomposition of Hydrogen Peroxide to release Oxygen gas in the presence of Manganese dioxide.
- Oxygen gas occupies one fifth of the air volume.

Oxygen occupies one fifth of the air volume



Observation:

-Formation of a gas at the top of the cylinder.

Conclusion:

-Hydrogen peroxide dissociates (decomposes) in presence of **manganese dioxide** into **water** and **oxygen gas.**

Explanation:

Oxygen gas replaces water in the cylinder and is collected at the top of the cylinder; this is called **downward displacement of water.**





Manganese-dioxide, works as a catalyst as it remains without change.

Catalyst: A chemical substance that accelerate the chemical reaction and remains without any change in its quantity and properties after the chemical reaction.

Give reason:

Manganese dioxide acts as a catalyst during the preparation of oxygen.

....

Properties of Oxygen:

1. Oxygen is a colorless, tasteless and odorless gas.
2. Oxygen **scarcely dissolves** in water.
3. Oxygen does not burn, but helps in burning.
4. Oxygen is **heavier** than the air as it replaces the air **(G.R)**.
5. Oxygen has a **neutral** effect on litmus paper.
6. Oxygen has the ability to react with most elements forming **oxides.**

Give reason:

Oxygen does not change the color of both red and blue litmus paper.

-Because oxygen has a neutral effect on litmus paper.



Oxygen combines with elements in two ways:

Oxidation	Burning
It is a **slow** reaction (combination) between oxygen and element in presence of moisture (water). **Example:** Iron rusting	It is a **rapid** reaction between oxygen and element to produce heat and light. **Example:** Burning a piece of cleansing wire.

Iron nails rust when they exposed to humid air. **(G.R)**

Due to the reaction of iron with of atmospheric oxygen during oxidation process.

Activity: To show that the weight of elements increases after combination with oxygen:



Observation:

-The weight of the burnt ball is heavier than the other ball

Conclusion:

-The weight of elements increases after combination with oxygen.

Cleansing wires becomes heavier after burning. **(G.R)**

Due to the reaction (combination) between oxygen and iron forming iron oxide during combustion process.



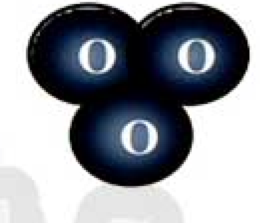
► The Importance of Oxygen:

1. Formation of **water**, as the water consists of 2 Hydrogen atoms and 1 atom of Oxygen atom.

2. Important for Respiration process.

3. Important for food combustion inside the cell to produce energy necessary for vital processes.

4. Formation of **Ozone layer (O3).**
   (This protects the earth from the harmful radiation coming from the sun).



5. Oxygen is compressed in iron cylinders and used in:

1. **Mechanical Ventilation** for patients who suffer from breathing difficulties.
2. **Sterilizing during surgeries**.
3. **Breathing** during **diving** and **climbing** mountains.
   As it is hard to breath at high mountains due to lack of oxygen.
4. **Producing Oxy-acetylene** flame for cutting and welding metals.
   When it is combined with acetylene gas to produce Oxy-acetylene flame whose temperature is 3500 ° C



Problems of iron rusting (oxidation)

-It causes erosion and damage of ironware as the bridges' pillars.



Method to avoid iron rusting

-Isolation of ironware by paints to protect them from rusting.

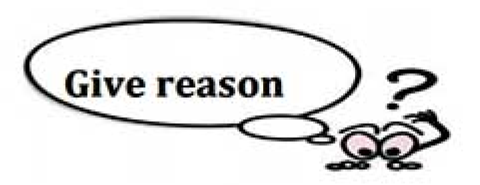




O3

- ♣ Ozone molecule (O_3) consists of three oxygen atoms.
- ♣ The weight of element increases after combustion with oxygen.
- ♣ Iron nails rust (lose their metallic luster) when exposed to moist air due to combination with oxygen and formation of oxides.



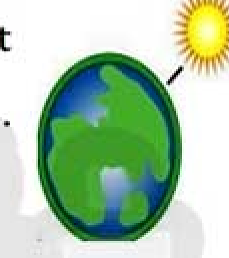


Oxy-acetylene flame is used for cutting and welding metals.



-Because its temperature reaches to 3500 ^{0}C sufficient to melt metals.

Ozone layer is very important is very important for the life of all living organisms.



-Because it protects the earth from harmful radiation that come from the sun.

Oxygen cylinders are used during climbing mountains.



-Because when we rise above the earth's surface, the oxygen percentage decreases as it is heavier than air.

Exercise on Lesson One

Complete the following:

1) The atmosphere composed of different gases such as…………………., ……………………………and…………………………..
2) The atmosphere protect the earth from………………………………and adjust the…………………………..of earth.
3) The more abundant gas in the atmosphere is…………………………
4) ……………………..is the main source of oxygen gas.
5) Oxygen gas is consumed during…………… and…………… processes.
6) The oxygen gas is produced by green plants during ………………………………..process.
7) Oxygen gas represents…………………..of the air volume while……………………represents 78% of the air volume.
8) Nitrogen gas occupies…………………………of the air volume.
9) The water molecule composed of………………………..and two hydrogen atoms.
10) Oxygen molecule consists of………………………..atoms, while……………………molecule consists of three oxygen atoms.
11) Oxygen is prepared in laboratory by the decomposition of …………………………in the presence of…………………… as a catalyst.
12) Oxygen has a………………..effect on litmus paper.
13) Oxygen gas is…………………than air, so it replaces air.
14) Oxygen can react with most elements and form………………………..



15) Oxidation process is……………………….reaction between oxygen and elements to produce………………………….

16) Burning process is……………………….reaction between oxygen and elements in the presence of moisture.

17) Iron nails……………………….when they are exposed to humid air.

18) Cleansing wires……………………….in weight when they are burnt.

19) Oxygen gas forms……………………….which protects the earth from the ultraviolet radiation.

20) Oxygen combines with acetylene gas to produce……………………. which is used in……………………………metals.

21) The temperature of oxy-acetylene flame rises to…………..^{0}C that is sufficient to melt metals.

22) ……………………….and…………………….are from the uses of oxygen.

Give Reason:

1) The atmosphere is important for our life on the earth.

----

2) The Oxygen and Nitrogen are more abundant in the atmosphere.

----

3) Oxygen has a fixed ratio in the atmosphere.

----

4) Green plants are the main source of oxygen on the earth.

----

5) Using Hydrogen-peroxide in preparation of Oxygen.

----

6) Magnesium dioxide is used to prepare Oxygen gas.

----

7) Oxygen gas is collected by downward displacement of water.

----

8) The iron nails rusted after leaving it in the humid air.

----

9) Cleansing wires becomes heavier after burning.

----

10) Using cylinder of compressed oxygen during climbing mountains.

----

11) Ozone layer is very important for life of all living organisms.

----

12) Oxygen gas is very important in hospitals.

----

13) Using oxygen gas in producing Oxy-acetylene flame.

----

14) Oxygen is important for human life.

Write the scientific term:

1. A Mixture of different gases surrounds the earth.	
2. The gas that represents one fifth of the volume of air.	
3. Two atomic molecule used in respiration process.	
4. A process of food making for the plants.	
5. A gas that its molecule is composed of three oxygen atoms.	
6. A chemical material used to prepare Oxygen gas.	
7. A chemical substance that remain without any change in its quantity and properties during a chemical reaction.	
8. A catalyst used in preparation of Oxygen gas.	
9. A slowly reaction between oxygen and elements in presence of moisture.	
10. A rapid reaction between oxygen and elements	



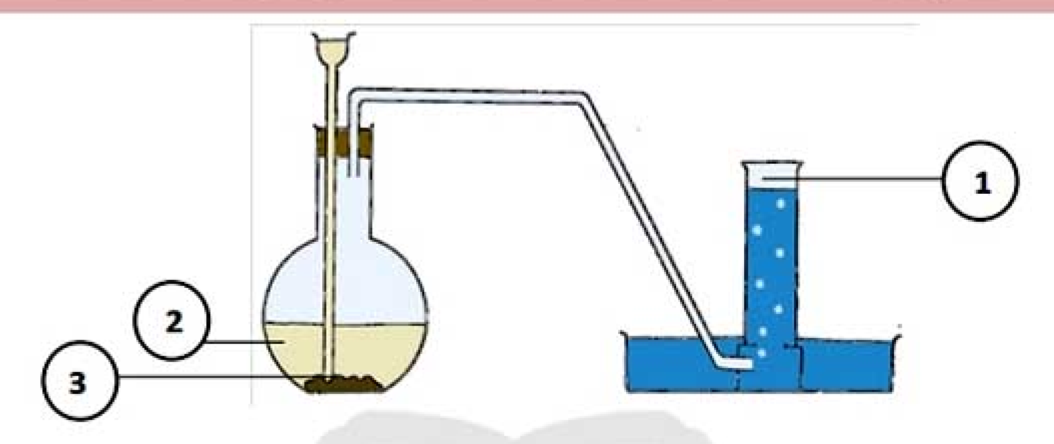
producing light and heat.	
11. A flame used in cutting and welding metals.	
12. A substance results from the combination between oxygen gas and elements.	
13. A layer that protects the earth from harmful radiations coming from the sun.	
14. A way by which oxygen gas is collected during its preparation in laboratory.	

What happens when:

1. Leaving iron nails in moist air for a long time.
   ....
2. Hydrogen peroxide is dropped over manganese dioxide.
   ....
3. Ozone layer is decayed.
   ....
4. The bridges' pillars are not isolated with paints.
   ....
5. A blue and red litmus paper are put in a cylinder full of oxygen.
   ....
6. The percentage of oxygen gas decreases in the atmosphere.
   ....



Look at the following figure, then answer the following questions:



1. The produced gas is.................................

2. The produced gas is collected by..................................of water.

3. Label the figure:

(1)............................

(2)............................

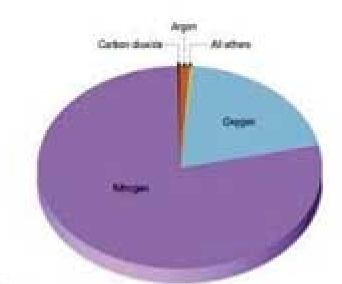
(3)............................

4. What is the importance of no.(3)?

....

Carbon Dioxide

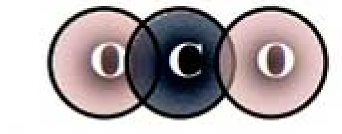
Lesson Two: Carbon Dioxide



Carbon Dioxide: a gaseous chemical compound in its natural state.

Carbon dioxide gas represents **0.03 %** from the air volume.

- Carbon Dioxide molecule composed of **One carbon atom**&**Two oxygen atoms**.



- It is very important for photosynthesis of green plants.

- **Benefits of Carbon dioxide:**

  Carbon Dioxide gas is important in photosynthesis process **(G.R)**because the plant use it to build their bodies and form the food of all living organisms.

- **Harms of Carbon dioxide:**

  The removal of forests leads to the increase of carbon-dioxide gas percentage in the air which causes harms to the earth's climate and raises its temperature.



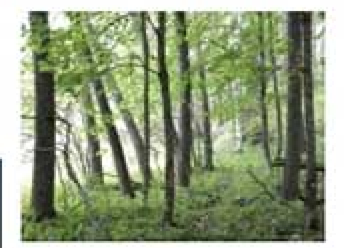
Carbon dioxide sources:

1. Carbon dioxide results from combustion of organic material such as (Wood–Coal–Oil–Gasoline)
2. Respiration of all living organisms during exhalation process.

- **Factors that increases the percentage of carbon dioxide in air:**

1. Removal of forests.

2. Combustion of fuel in factories and means of transportation.



(G.R):The environment suffers from an increases of carbon dioxide gas.

Due to removal of forests and combustion of fuel in factories and means of transportation.

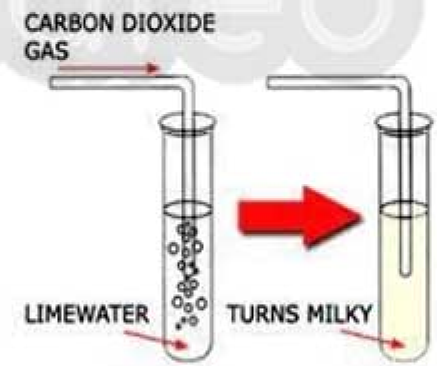
Activity: To prove that carbon dioxide gas is produced during exhalation (respiration) process:

Observation:

-Lime water becomes turbid.

Conclusion:

1. Exhaled air contains carbon dioxide gas.
2. Carbon dioxide gas turbid clear lime water.





Give reason:

1. Lime water turns milky when CO_2 passes through it.

Due to formation of chemical substance called calcium carbonate which is insoluble in water.

2. When you blow in a jar that contains lime water, it turns turbid.

Because exhaled air contains CO_2 gas that turbid clear lime water.

Activity: To prove that carbon dioxide gas is produced during respiration of plants:

Observation:

Lime water becomes turbid (milky).

Conclusion:

Carbon dioxide gas is produced during respiration of plants.

Note: Carbon dioxide turbid the clear lime water (turns into milky).

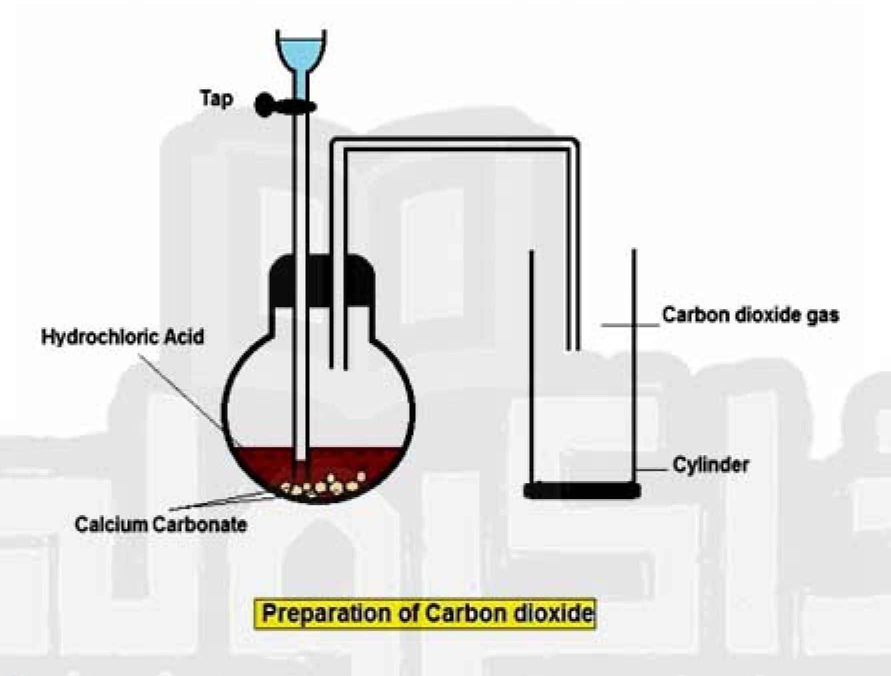
Lime water is used to detect the presence of carbon dioxide.



Preparation of carbon dioxide:

Carbon dioxide results from the reaction between **Calcium carbonate** with **diluted hydrochloric acid.**

Carbon dioxide cannot be collected by displacing the water downward, because it dissolves in water and heavier than it.



Preparation of Carbon dioxide

Observation:

Carbon dioxide gas evolves then it is collected in the cylinder.

Conclusion:

Carbon dioxide gas is prepared by **upward displacement of air.**

DON'T FORGET!

CO2 gas is collected by upward displacement of air because it is heavier than air.



Give reason:

1.Carbon dioxide is not collected by displacement of water.

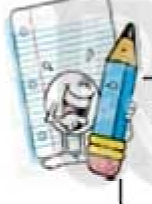
Because it is easily dissolved in water.

2. Carbon dioxide gas is collected by upward displacement of air.

Because it is heavier than air.

Properties of carbon dioxide:

1) It is colorless, tasteless and odorless gas.
2) It doesn't burn and doesn't help in burning.
3) It easily dissolves in water, so it is not collected by displacement of water **(G.R)**
4) It is heavier than air.
5) It reacts with magnesium to form white powder **(magnesium oxide)** and the black ash **(carbon or coal)** will deposit on the walls of the tube.



Carbon dioxide is also prepared by adding lemon juice or vinegar to sodium bicarbonate (baking powder)



Importance of carbon dioxide:

1) Used in making soft drinks.

2) Used in extinguishing (putting out) fires **(G.R)**

Because it doesn't burn and doesn't help in burning.



3)Used in refrigeration.

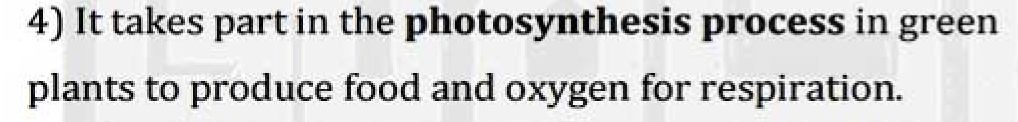


Where CO_2 is condensed by pressure and cooling then pressure is relieved forming dry ice that is used in refrigeration.

3)It is used in making bread bubbled and tasty.

*Because the **fermentation** of yeast added to the bread produces carbon dioxide which expand by heating and make the food porous and tasty.*

4) It takes part in the **photosynthesis process** in green plants to produce food and oxygen for respiration.





Give reason:

Photosynthesis process is important for plants and all living organisms.

Because:

1. It produces **food** for plants needed to build their bodies as well as food for all living organisms.
2. It produces **oxygen** needed for respiration of all living organisms.

Give reason:

1. Yeast is added to dough on making bread.

-To produce CO_2 by fermentation, which expand by heat making bread porous and tasty.

2. Carbon dioxide is called the silent killer.

-Because it is colorless, tasteless and odorless gas, so man may be suffocated if he breathes it.

3. Removing forests (green areas) is harmful.

-Because this leads to an increase in percentage of CO_2 in air, which causes severe harms for the earth's climate and raises its temperature.

4. Carbon dioxide is used in extinguishing fires.

-Because it does not burn and does not help in burning.

What happens when:

1. A lighted candle is put in a cylinder filled with CO_2 gas.

-The candle will be extinguished.

2. A lighted magnesium ribbon is inserted in a cylinder filled with CO_2.

-A white powder is formed and a black substance deposits on the wall of the cylinder.



3. Most forests on earth are removed.

-The percentage of carbon dioxide will increase which causes many harms to living organisms.

4. The percentage of carbon dioxide increases on earth.

1) Increasing the temperature of the earth's surface.

2) Suffocation of living organisms.



Exercise on Lesson Two

Complete the following:.

1) Carbon dioxide represents……………..from the air volume.
2) Carbon dioxide molecule consists of……………atom(s) of oxygen and…………….atom(s) of carbon.
3) CO2 gas is important for………………………process for plants.
4) Rising the ratio of carbon dioxide in the atmosphere leads to rising the……………………………….of the climate earth.
5) Carbon dioxide gas results from the combustion of organic materials such as………………………and……………………………
6) Caron dioxide gas can be resulted from……………………of living organisms.
7) Exhaled air contains a large amount of……………………gas.
8) ……………………is a chemical substance used to detect the presence of carbon dioxide gas in air.
9) Carbon dioxide can be produced from the reaction between ……………………………………and……………………………………….
10) Carbon dioxide gas cannot be collected by………………. displacement of …………………..
11) Carbon dioxide gas reacts with magnesium ribbon in a testing tube and then…………………………can deposits on the walls of the tube.
12) Carbon dioxide is used in making………………………….

13) After cooling carbon dioxide gas it turns into………………………………… used in refrigeration.

14) …………………………and…………………………are properties of carbon dioxide.

15) Yeast is added to dough to produce……………………which makes bread porous and tasty.

Give Reason:

1) Carbon dioxide is tri-atomic molecule.

……………………………………………………………………………………………

2) Carbon dioxide gas is dangerous after raising its ratio in the atmosphere.

……………………………………………………………………………………………

3) Clear lime water changes into turbid after passing the carbon dioxide gas through it.

……………………………………………………………………………………………

4) Water cannot be used in the preparation of carbon dioxide.

……………………………………………………………………………………………

5) Carbon dioxide is collected by displacement of air upward.

……………………………………………………………………………………………

6) Carbon dioxide is used in refrigeration.

……………………………………………………………………………………………

7) Yeast is added to dough in making bread.

……………………………………………………………………………………………

8) Carbon dioxide is used in extinguishing fire.

....

9) CO_2 has great importance for continuity of life on earth.

....

10) Decreasing green areas is harmful.

....

11) Burning magnesium ribbon in presence of carbon dioxide gas produces white and black substance.

....

What happens when:

1. You blow in a jar that contains clear lime water.

....

2. Dilute hydrochloric acid is dropped over calcium carbonate.

....

3. A lighted candle is put in a cylinder filled with carbon dioxide gas.

....

4. A lighted magnesium ribbon is inserted in a cylinder filled with CO2 gas.

....

5. Lemon juice is added to sodium bicarbonate.

....

6. Yeast is added to dough on making bread.

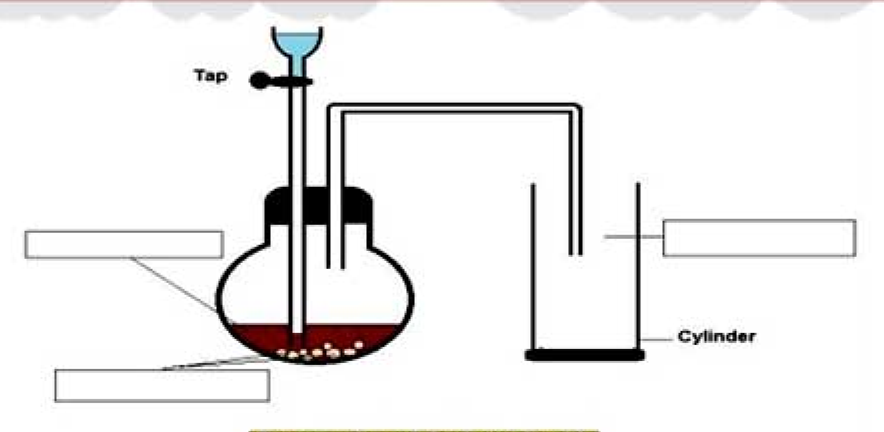
....



Write the scientific term:

1. A gaseous molecule represents 0.03% from the air volume.	
2. A material in cigarettes produces CO2 after burning.	
3. A process in plants requires taking in carbon dioxide gas.	
4. A liquid can be turbid if CO2 passes through it.	
5. An acid used to prepare Carbon dioxide gas.	
6. A chemical solid substance used in preparation of carbon dioxide.	
7. Material deposits on the walls of the testing tube after burning magnesium ribbon in it.	
8. The process that results from adding yeast to dough and carbon dioxide is produced.	

Complete the following diagrams:



Preparation of Carbon dioxide

Choose the correct answer:

1.The ratio of carbon dioxide gas in air is........

a) 1 % b) 0.03 % c) 21% d) 78 %

2. Carbon dioxide is produced from.........

a) exhalation b) photosynthesis c) candle burning d) (a) & (c)

3. Carbon dioxide molecule consists of..........

a) one oxygen atom and two carbon atoms.

b) one carbon atom and two nitrogen atoms.

c) one carbon atoms and two oxygen atoms.

d) one carbon atom and one oxygen atom.

4. Carbon dioxide is prepared by adding dilute hydrochloric acid over........

a) calcium carbonate. b) calcium chloride

c) calcium sulphide d) (a) and (b)

5. Carbon dioxide is collected by...........

a) upward displacement of water.

b) upward displacement of air.

c) downward displacement of air.

d) down displacement of water.

6. ....gas is heavier than air.

a) Oxygen b) Nitrogen c) Carbon dioxide d) no correct answer



7. When exhaled air passes through clear lime water, it turns turbid due to formation of a substance called.........

a) calcium chloride b) sodium carbonate

c) calcium carbonate d) calcium sulphate

8. ....gas is used in extinguishing fire.

a) Oxygen b) Carbon dioxide

c) Nitrogen d) (a) and (b)

9. ....gas is prepared by adding dilute hydrochloric acid to calcium carbonate.

a) Oxygen b) Carbon dioxide

c) Nitrogen d) Neon

10. When a magnesium ribbon burns for a short time in a cylinder containing CO_2, it produces........

a) calcium carbonate b) magnesium oxide

c) carbon d) (b) and (c)

11. A gas which turns limewater into turbid is.........gas.

a) oxygen b) ozone c)carbon dioxide d) nitrogen

12. Adding lemon juice to sodium bicarbonate produces.......

a) CO2 b) O2 c) N2 d) (a) and (b)

13. When a glowing magnesium ribbon is inserted in a jar containing CO_2.........element deposits on the wall of the jar.

a) magnesium   b) carbon

c) magnesium oxide   d) calcium carbonate

14. By adding yeast to dough, ...is produced and expanded by heat, to make bread porous and tasty.

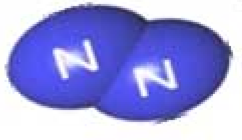
a) oxygen gas   b) calcium carbonate

c) carbon   d) carbon dioxide gas

Lesson Three: Ni trogon

Nitrogen

Nitrogen: is a gaseous element, its compound has **2 Nitrogen** atoms **(N2)**



N N

- Nitrogen is called **azotes** (lifeless) **(G.R)**
  because it doesn't help in burning and it is not included in respiration process.
- Nitrogen represents **78%** percent from the air volume.
- It is the most abundant gas in air.
- Nitrogen exists in:
  1. Nitrogen is the main component of the **proteins** which make tissues of all living organisms.
  2. Nitrogen oxides are formed during the lightening and reach the earth during the rainfall.
  3. Nitrogen is used by the legumes plants to produce protein, with the help of **nodular bacteria** in roots.

Properties of Nitrogen gas:

a) It is colorless, tasteless and odorless gas.

b) Hardly (scarcely) dissolves in water .

c) **N2 solution turns the red litmus paper into blue (alkaline effect).**

d) Doesn't help in burning.

e) Nitrogen is condensed to be liquid so as to be used in cooling.





f) Nitrogen combines with **lighted magnesium ribbon** forming a white substance that reacts with **water** forming **ammonia** gas that has a pungent odour.

g) Nitrogen can be condensed into a **liquefied state**.

The importance of Nitrogen Gas:

1) Nitrogen is used in filling car tires, as it keeps the temperature and the volume of the tires steady.
2) Liquid Nitrogen is used in
   A. Treatment of skin tumors.
   B. Preserving food products (because it freezes the food quickly)



3) Nitrogen is used in making **ammonium nitrate** as **Soil fertilizers**.
4) Used in small amounts to fill in some types of lamps.
5) Used to store petroleum and flammable materials (**G.R**); because it is inactive material.
6) Used in making
   A. Stainless steel
   B. Electronics
   C. Gunpowder







Give reason:

1. Nitrogen is recently used in filling car tires.

-Because it causes relative constancy of the volume of tires when the temperature changes.

2. Nitrogen is used in the tanks of liquefied explosives.

-Because it is an inactive material.

3. On putting a lighted match in a cylinder filled with nitrogen, the match is off.

-Because nitrogen doesn't help in burning.

4. On exposing a wet litmus paper to ammonia gas, it turns blue.

-Because ammonia gas has an alkaline effect on litmus paper.

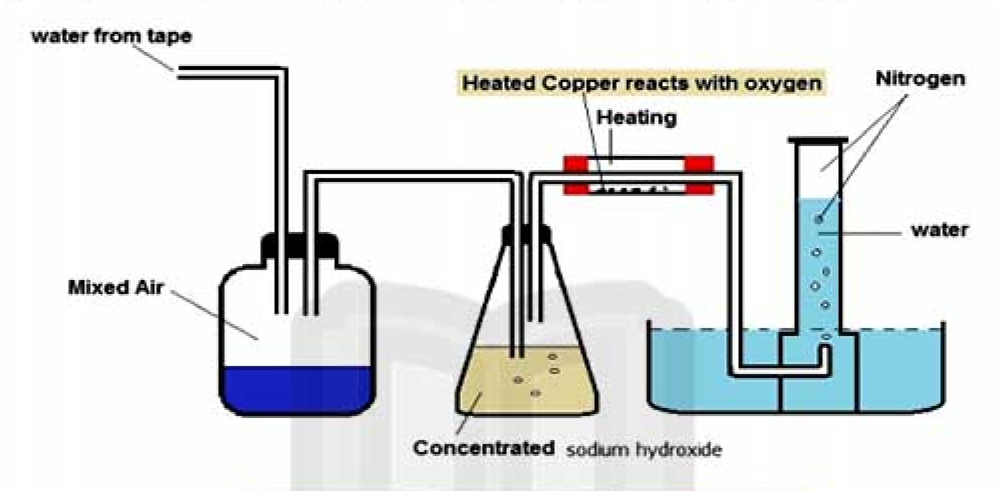
5. Liquified nitrogen is used in cooling food, medicines and vaccines.

-Because liquefied nitrogen can freeze them and prevent their damage by heat.



Preparation of Nitrogen:

Preparation of nitrogen depends on the removal of oxygen and carbon dioxide **from the air** and then the nitrogen is collected



Preparation of Nitrogen from the air

Observation:

-Formation of a gas at the end of the cylinder.

Conclusion:

-Nitrogen is prepared by passing atmospheric air through **concentrated solution of sodium or potassium hydroxide** (to absorb small amount of carbon dioxide) then **hot copper** (to combine with oxygen).



Nitrogen gas is collected by **downward displacement of water.**

Give reason:

Nitrogen is collected by downward displacement of water.

-Because nitrogen is scarcely soluble in water.

Exercise on Lesson Three

Complete the following:

1) Nitrogen is a gas represents……………..of air volume.
2) Nitrogen molecule consists of…………………atoms and its symbol is……………
3) Nitrogen is a basic element in forming…………………which forms the tissue of all living organisms.
4) Nitrogen is called…………………………because it does not take part in respiration process.
5) Nitrogen………………………dissolves in water.
6) The plants can produce proteins by the help the of………………………in the roots.
7) Nitrogen can be prepared in lab by displacement of water because nitrogen……………………………in water.
8) Nitrogen is prepared by the removal of………………………….and…………………….from the air .
9) After the reaction of nitrogen with magnesium ribbon then adding water,………………………is formed.
10) Ammonia gas turns the color of……….litmus paper into……….
11) ……………………gas is used in manufacture of ammonia.
12) Small amounts of nitrogen is used to fill the……………….and keeps them from raising the temperature.
13) Nitrogen in a…………….state is used to treat the skin tumors.

14) Nitrogen is………………………material, so we use it in storing ………………………materials.

15) The solution of nitrogen gas turns the red litmus paper into………………

16) Nodular bacteria fix………………in roots of legumes such as beans and clover.

17) ……………………contributes in composition of all living tissues of living organisms.

18) Nitrogen gas is collected by……………displacement of…………

19) The removal of carbon dioxide gas from air during preparation of nitrogen gas is done by passing air over…………………………

20) The removal of oxygen gas from air during preparation of nitrogen gas is done by passing air over……………………………

Choose the correct answer:

1. Nitrogen molecule consists of……….nitrogen atoms

a. One b. two c. three d. four

2. Nitrogen represents……….of the earth's atmosphere.

a. 87% b.78% c. 0.03% d. 21%

3. The main source of nitrogen is……….

a. Air b. water c. carbon dioxide d. a, b and c

4. The most abundant gas in the air is…………

a. Carbon dioxide b. oxygen c. nitrogen d. helium



5. Nitrogen oxide is formed by combination of nitrogen with..........
a. Water b. oxygen c. carbon dioxide d. a and b

6. To prepare nitrogen form air, we should remove........from air.
a. Oxygen b. hydrogen c. carbon dioxide d. (a) and (c)

7. On putting a lighted magnesium ribbon in a cylinder containing nitrogen gas, then add a little amount of water,..........gas evolves.
a. Nitrogen oxide b. ammonia c. potassium hydroxide d. nitrates

8. Nitrogen is the main component of..........
a. fats b. carbohydrates c. proteins d. (a), (b) and (c)

9. ....is called ''azote'' which means lifeless.
a. carbon dioxide b. oxygen c. water d. nitrogen oxide

10. Ammonia gas has a(an)..........effect on litmus paper.
a. Acidic b. alkaline c. neutral d. (a) and (b)

11. Nitrogen gas has a(an)...........effect on litmus paper.
a. Acidic b. neutral c. alkaline d. (b) and (c)

12. The pungent smell that emits when a lighted magnesium ribbon reacts with nitrogen gas is..........
a. Oxygen b. nitrogen c. ammonia d. carbon dioxide

13. A gas used to store petroleum and some flammable materials is...........
a.Oxygen b.nitrogen c. hydrogen d. carbon dioxide

14. A gas used to fill some types of lamps is...........
a.Oxygen b.nitrogen c. hydrogen d. carbon dioxide

15. Nitrogen gas is used in manufacture of............
a.Fire extinguishers b. soil fertilizers c. soft drinks d. dry ice

16. Recently, car tires are filled with...........gas
a.Oxygen b.carbon dioxide c.nitrogen d.hydrogen

17. Soil fertilizers are manufactured from...........
a.Ammonia b.ammonium nitrate c.carbon dioxide d. (a) and (b)

18. ....gas is one of the components of gunpowder.
a.oxygen b.carbon dioxide c.nitrogen d. argon

Give Reason:

1) Nitrogen is called azote (lifeless)

....

2) Nitrogen gas is collected by down displacement of water.

....

3) Nitrogen can be prepared from the air.

....

4) Liquid nitrogen has a great importance in the manufacturing a lot of products.

....

5) Nitrogen is used in storing flammable materials.

....

6) Nitrogen can be used in manufacturing of important substances for the soil.

....

7) Nitrogen is very important in human's life.

....

8) The main source to prepare nitrogen is air.

....

9) During preparation of nitrogen, air is passed over sodium or potassium hydroxide.

....

10) During preparation of nitrogen, air is passed over sodium or potassium hydroxide.

....

What happens when:

1. Nitrogen gas is present in the atmospheric air.

....

2. Atmospheric air is passed over a tube containing hot copper.

....

3. Atmospheric air is passed over sodium or potassium hydroxide.

....

4. Oxygen reacts with nitrogen during lightning.

....

5. Getting rid of bacteria in soil.

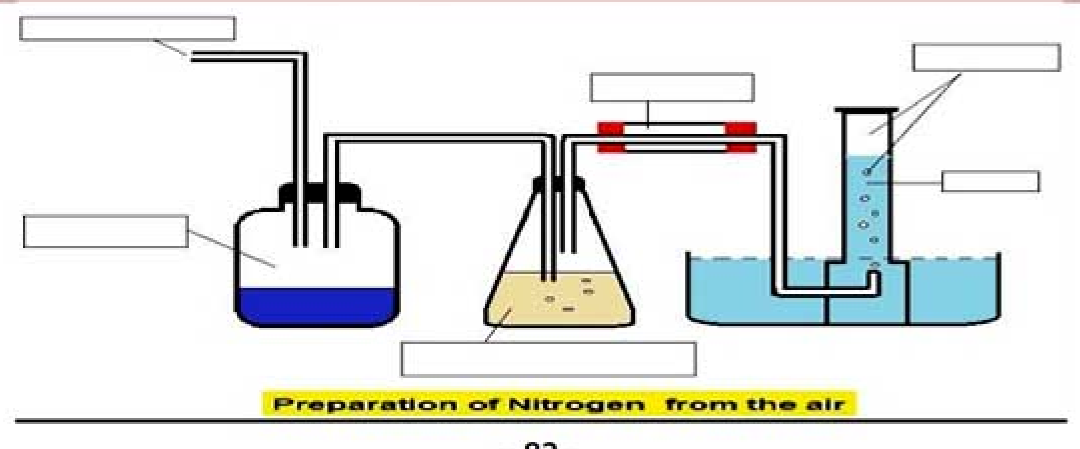
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Write the scientific term:

1. A gaseous molecule represents 78% from the air volume.	
2. A gas called azote which means lifeless gas.	
3. A gas used in filling some types of lamps.	
4. A chemical substance used in preparing nitrogen.	
5. A gas that composes the protein substance that builds up the body of all living organisms.	
6. A chemical substance with pungent odour can be produced by the reaction between the nitrogen and magnesium then water.	
7. A chemical substance made of the nitrogen a soil fertilizer.	
8. A substance that absorbs carbon dioxide gas from air during preparation of nitrogen.	
9. A substance that absorbs oxygen gas from air during preparation of nitrogen.	
10. Chemical substance formed as a result of combination between oxygen and nitrogen during lightning.	

Complete the following diagram:



Name: ……………………………………………

20

Primary Six

TEST on Unit Three

First:

/ 5

a) **What happens if:**

1. There is no nitrogen in the atmospheric air.

………………………………………………………………………………………

………………………………………………………………………………………

2. The plant can't carry out the photosynthesis process.

………………………………………………………………………………………

………………………………………………………………………………………

b) **Complete the following:**

1. The nitrogen is prepared by the removal of …………………… and …………………… from the atmospheric air.
2. Oxygen gas has………………………on litmus paper.
3. Increasing the ratio of carbon dioxide gas in the atmosphere leads to increase ……………………of the earth that cause global warming.
4. Carbon dioxide has ………………………… effect on the litmus paper.
5. Nitrogen reacts with magnesium and dissolve in water to give …………………………

/5

Second: Write Scientific Term:

1. Gas used in the process of forming organisms' tissues.	
2. Material formed after the combination of oxygen with any elements.	
3. A rapid reaction with oxygen to produce heat and light.	
4. The Plants that fix the atmospheric nitrogen by the help of nodular bacteria.	
5. A mixture of gases surrounds the earth to protect it from harmful radiations.	

/ 5

Third: Give Reason for each of the following:

1. Using of Sodium hydroxide in the preparation of Nitrogen.

   ....

2. Carbon dioxide cannot be collected by the displacement of water.

   ....

3. The nodular bacteria are very important or Legumes plants which form protein.

   ....

4. Oxygen cannot change the color of the litmus paper.

   ....

5. Nitrogen is used in storing Explosive (flammable) materials.

   ....



Fourth: / 5

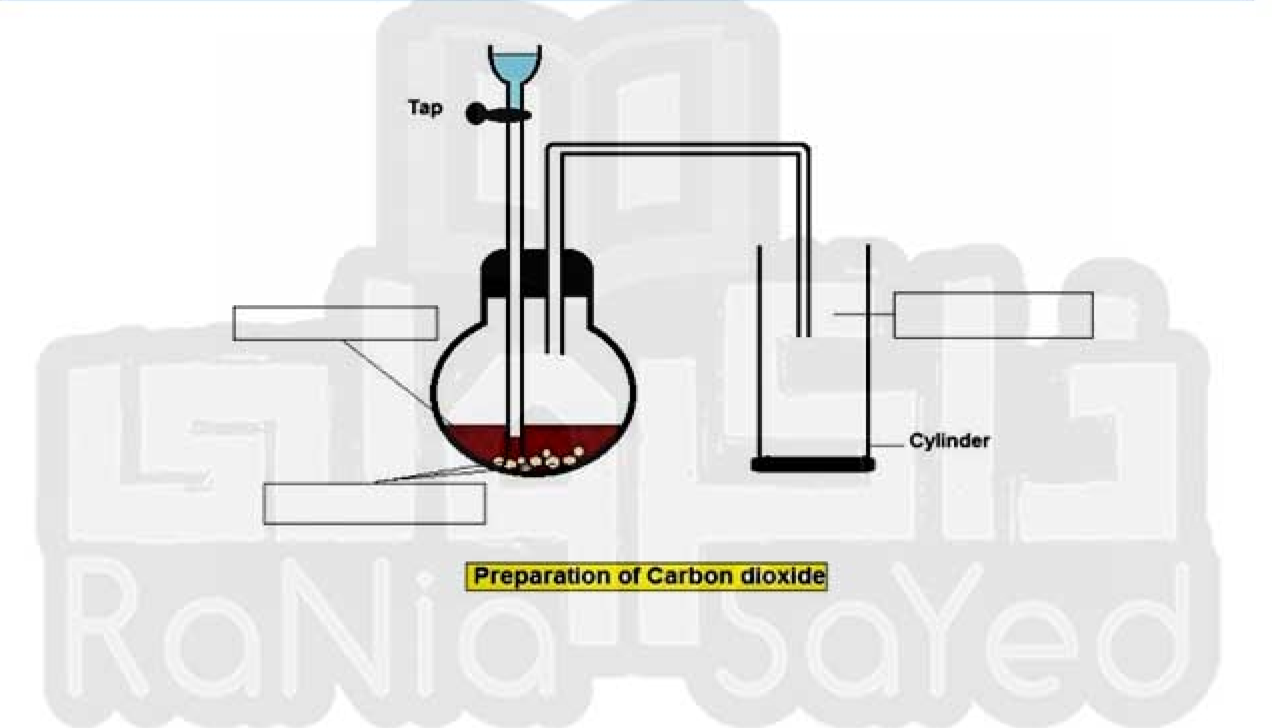
a) Mention 2 uses of Nitrogen gas.

....

....

....

b) Complete the following diagram:



Preparation of Carbon dioxide





Unit Four

The structure and the Function of the Human body



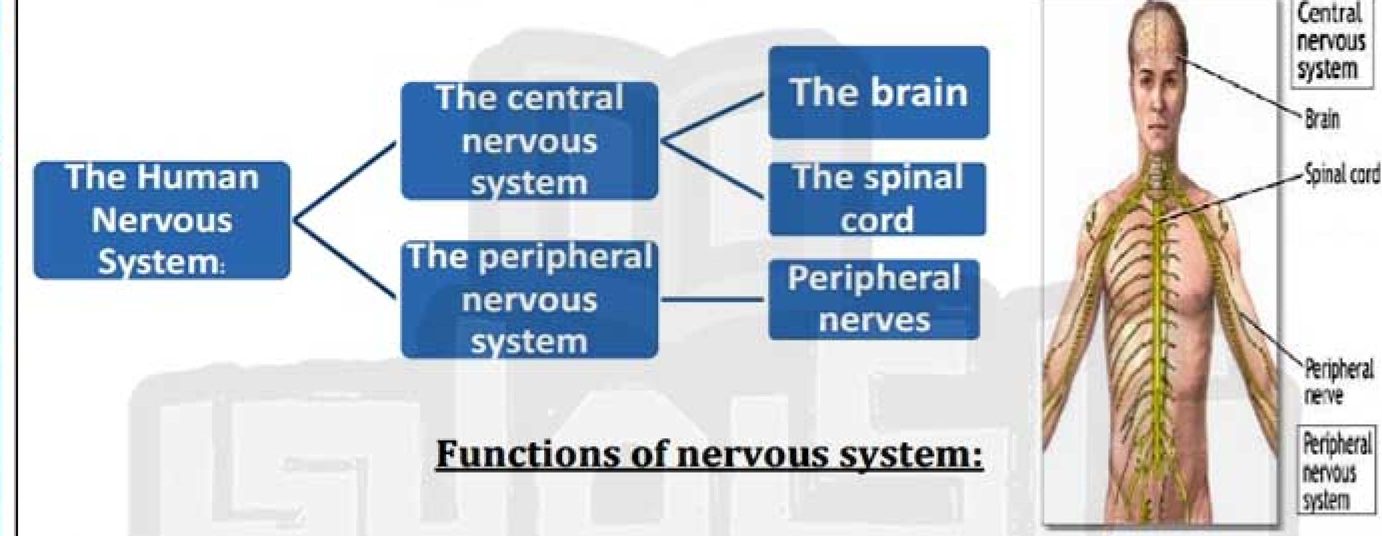
Lesson One:

The Human nervous system

Nervous system

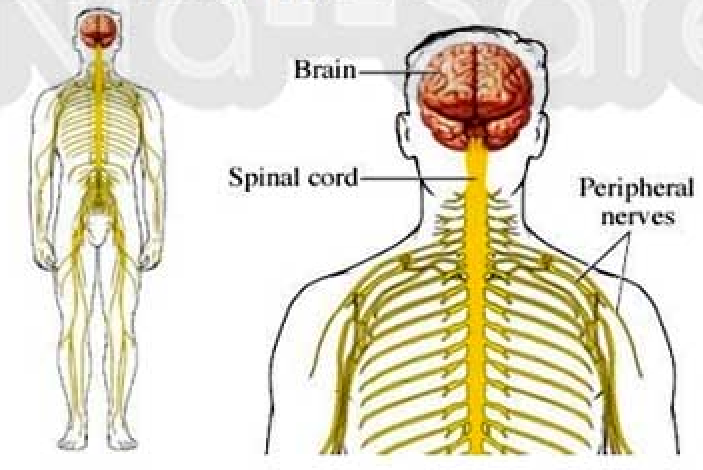
It is a communication and controlling body system.

The human nervous system is composed of two major parts:



Functions of nervous system:

It receives information from the environment and the body, interprets this information and makes the body respond to it.





The Neuron:

- The building unit of the nervous system, it is called nerve cell.

The structure of the neuron:

1. The cell body:

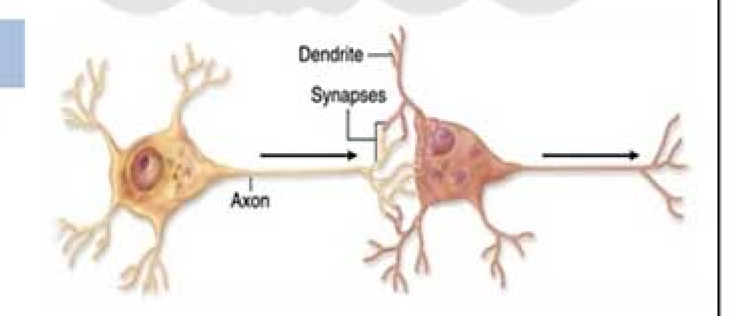
- It contains a nucleus, cytoplasm, plasma membrane.
- **Dendrites:** some branches extend from the cell body.
- **Function of dendrites:** Connecting neighboring neurons to form **synapse.**

2. The Axon:

- A cylindrical axis covered with a fatty layer called **myelin sheath**.
- **Axon terminals:** They are nerve endings of axon connected to the muscle.

Synapse:

An area in which the terminals of neurons are connected the dendrites of another neuron.



THE CENTRAL NERVOUS SYSTEM.

First: # THE CENTRAL NERVOUS SYSTEM.

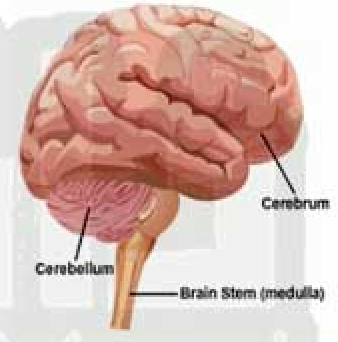
The central nervous system composed of: **(the brain & the spinal cord)**

1. The Brain:

- It is the main control sysetm in the human body.
- It is located in a bony box called the **skull**, to ptotect it.
- The brain is composed of; Cerebrum - cerebellum - Medulla oblongata
- **Function of the brain:**
- -It directs and coordinates all the processes, ideas, behaviours and emotions.

The structure of the brain:



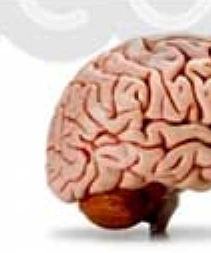


The brain consists of:

1. **Cerebrum**
2. **Cerebellum**
3. **Medulla oblongata**

1. Cerebrum:

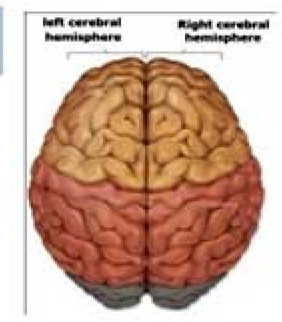
- It is the largest part of the brain.
- It is divided into two halves called the **cerebral hemispheres**, separated by fissures.



- The outer layer is a grey and it is called **cerebral cortex** and it is grey.
- The cerebral hemispheres have many convolutions.



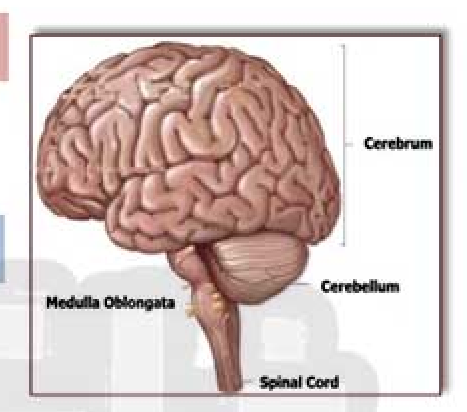




➢ **The function:**

1) Contain **thinking and memory centers.**
2) Control the **voluntary actions** such as walking and running.
3) Receive the nerve impulse from **sense organs** (eyes, ears, nose, tongue and skin) and send responds to them.

2. The cerebellum:



➢ It lies at the back of the brain below the two cerebral hemispheres.

➢ **The function:**

-Maintain the **body balance** during movement.

3. The medulla oblongata:

➢ It is located in front of the cerebellum.

➢ It connects the brain with the spinal cord.

➢ **The function:**

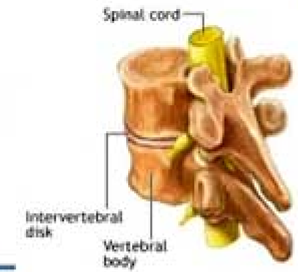
-It controls the **involuntary actions**, such as:

a. Regulating heart beats.
b. Regulating the movement of respiratory system parts.
c. Regulating the movement of the digestive system parts.



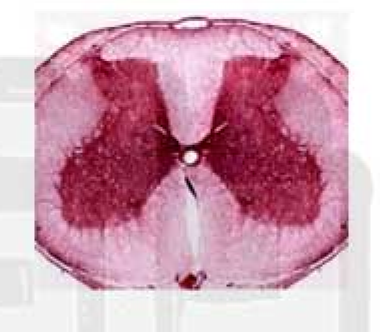
2. The spinal Cord:

- It is a cylindercal cord which extends in a channel of vertebrae in the back bone **to protect it.**
- The spinal cord composed of:
  1) Internal grey matter that has the shape of **letter H**
  2) External white matter.
- The spinal nerves extend from the spinal cord.



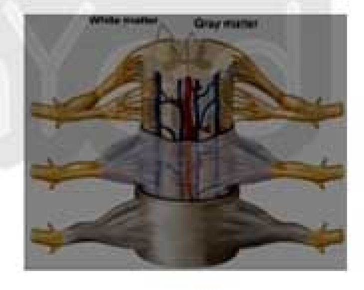
The function of the spinal cord:

1) It responsible for the **reflex action**,
Such as withdrawal of hand quickly on touching a hot surface.



2) It delivers nerve messages from body organs to the brain and vice versa.







THE PERIPHERAL NERVOUS SYSTEM.

Second: # THE PERIPHERAL NERVOUS SYSTEM.

It is the nerves that emerge from the central nervous system (brain & spinal cord)

- **The function:**

  1) It delivers **sensory information and kinetic** responses between **the central nervous system** and all **body parts**.
  2) It is responsible for the **reflexes.**

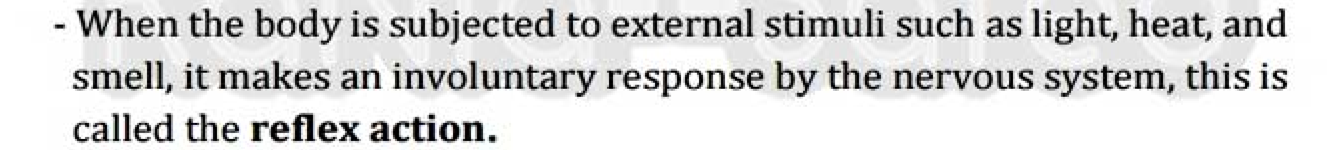
The peripheral nervous system consists of:

Cranial nerves

12pairs of nerves emerges from the **brain.**

Spinal nerves

31pairs of nerves emerges from the **spinal cord.**



- When the body is subjected to external stimuli such as light, heat, and smell, it makes an involuntary response by the nervous system, this is called the **reflex action.**

The reflex action:

- It is an automatic (spontaneous) response done by the body when it is exposed to an external stmulus.

The spinal cord is responsible for the reflex actions.



Examples of reflex actions:

- ❖ Withdrawing the hand quickly when touching a hot surface.
- ❖ Blinking when something gets close to the eye.
- ❖ Running quickly on seeing a fast moving car coming towards you
- ❖ Moving hand away quickly when touching a plant with sharp thorns.
- ❖ Constriction of the eye pupil on intense light and its widening on dim light.


▲ The hand touches a hot thing
▲ A thing gets close to the eye





How does the reflex action occur?

Example:

Withdrawing hand quickly when touching a plant with sharp thorns.

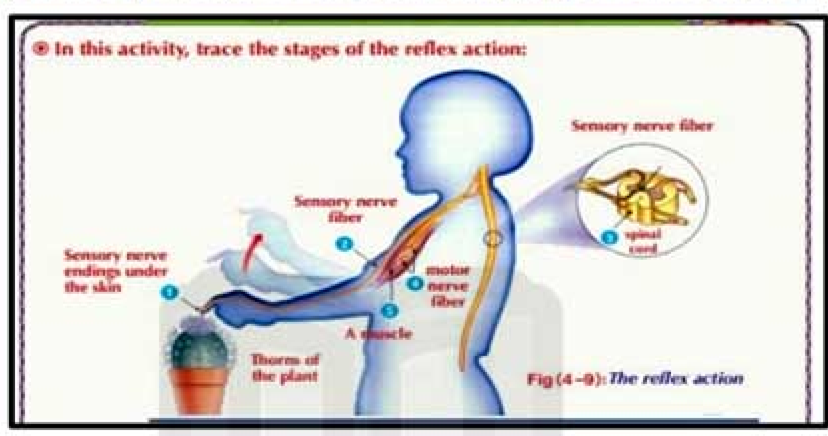


Fig (4-9): The reflex action

1- The severity of the thorns affects the nerve endings in the fingers producing nerve impulses.
2- Nerve impulses are transmitted to the spinal cord through a sensory nerve fiber.
3- Nerve impulses are transmitted from the spinal cord through a motor nerve fiber to arm muscles (without the brain's intervention).
4- Muscles contract and the arm withdraws away from the thorns.

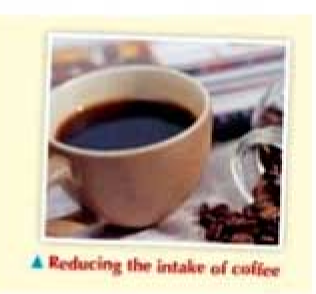
Other nerve impulses are transmitted from the spinal cord to the sensory centers in the brain which leads to the true sense of pain.

Importance of the nervous system:

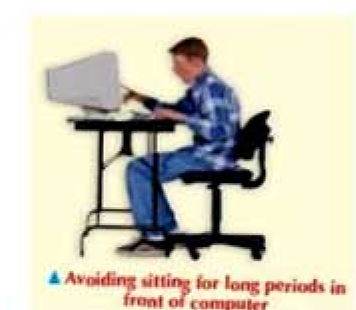
1) Carry the nervous messages from an organ of the body to another.
2) Regulate and coordinate all vital processes in the body.
3) Receive the external stimuli and identify (interpret) them then send response.



The way to maintain the nervous system:


▲ Reducing the intake of coffee

1) Reducing drinking of **stimulating substances** such as **tea and coffee.**
2) Staying away from **tranquillizers** and **stimulants**.
3) Take enough periods of sleeping to rest your body.


▲ Avoiding sitting for long periods in front of computer

4) Avoiding the exciting situations.
5) Doing physical exercises.
6) Staying away from all the sources of pollution such as smoke and noisy places.
7) Avoid staying for long periods in front of computer and television.
8) Staying away from addiction.


▲ Staying away from sources of pollution.

Health Notes:

- **Stimulants:** chemicals substances that make the brain more active.
- **Tranquillizers:** chemicals substance that make the brain calmer.

All of these materials destroy the nervous systems.

- "The stimulating substances can affect the sleeping periods and heart beats" **leading to the nervous tension (G.R)**





Give reason:

Drinking tea and coffee affects the nervous system.

Because they:

a. Affect sleeping periods.
b. Affect heartbeats.
c. Lead to nervous tension.

Addiction passively affects the nervous system.

Because it causes:

a. Retardation of memory and learning.
b. Nervous system.
c. Loss time sensation.
d. Sleepless.

You should not sit for long periods in front of the computer.

To avoid exhaustion of sense organs.



Exercises on Lesson one

Complete the following:

1. The human nervous system composed of two main parts they are ……………………………and ……………………………………
2. The building unit of the nervous system is called……………………
3. The neuron composed mainly of two parts they are ……………………and……………………
4. The cell body of the neuron contains ……….. ,………… and…………
5. The axon of the neuron is covered with a fatty layer called …………………………… and ends with ………………………………
6. ……………connect between neighboring neurons forming……………
7. The central nervous system composed of ……………………….. and ………………………
8. The brain composed of ………………, ………………and …………………
9. The brain is located in a bony box called……………………
10. ……………………is the largest part of the brain and it is divided into two halves called……………………
11. The cerebrum composed of left and right halves known as ……………………………………
12. The outer surface of the cerebral hemispheres is called ………………
13. The cerebral hemispheres contain the centers of ……………………and……………………



14. The cerebral hemispheres control……………………movements such as………………………

15. Cerebellum maintain the………………………during the movement.

16. ……………………receives nerve impulses from sense organs and send a suitable response.

17. …………………maintains the balance of the body during movement.

18. The medulla oblongata is located in front of………………………… and connects the brain with ………………………………

19. The medulla oblongata controls…………………………actions of the body such as heart beats and movements of the digestive system organs.

20. …………………………is responsible for regulating the involuntary processes of the body.

21. The spinal cord responsible for the……………………………such as withdrawing the hand on touching a hot object.

22. ……………………delivers nerve messages from the body organs to the brain and vise versa.

23. The peripheral nerves that emerge from the brain known as……………………………while the nerves that emerge from the spinal cord known as…………………………

24. In the spinal cord the grey matter has……………shape and is surrounded by the………………………………

25. The number of cranial nerves is………………and the number of spinal nerves is…………………



26. ……………………………is the involuntary response of the body when subjected to external stimuli.

27. The over intake of tea and coffee causes……………….…………..and ………………………………….

28. ……………………………nervous system delivers sensory information and kinetic response between the central nervous system and all body parts.

Write the scientific term:

1. Automatic response of the body to the different stimuli.	
2. Part of the nervous system responsible for the reflex action.	
3. The basic building unit of the nervous system.	
4. A bony box in which the brain is located.	
5. The main control center of the human body.	
6. An organ connects the spinal cord to the brain and responsible for the involuntary actions of the body.	
7. An organ consists of a grey matter in the form H letter surrounded by the white matter.	
8. An organ that contains the centers of thinking and memory.	
9. An organ that maintains the body balance during movement.	
10. A structure that links the brain with the spinal cord and is responsible for the involuntary actions.	



11. A part of the brain that lies at the back area of the brain below the two hemispheres.	
12. The left and the right halves of the cerebrum.	
13. Substances that affect the sleeping periods of the hearts beats.	

Locate the following organs:

1. The Brain: ……………………………………………………………………
2. The spinal cord: ……………………………………………………………
3. Hemispheres: ………………………………………………………………
4. Medulla oblongata: …………………………………………………………
5. Cerebellum: …………………………………………………………………
6. Grey matter: ………………………………………………………………

Give reason for each of the following:

1. Damage of the medulla causes the death.

……………………………………………………………………………………

2. It is important take enough sleeping periods.

……………………………………………………………………………………

3. You must reduce the intake of stimulants such as tea and coffee.

……………………………………………………………………………………

4. Withdrawal of the hands suddenly on touching hot object.

……………………………………………………………………………………

5. The brain is located inside a skull and the spinal cord extends through a series of bony vertebrae.

……………………………………………………………………………………



6. The nervous system is one of the most important systems in the human body.

....

7. You must stay away from the sources of pollution.

....

What happens if?

1. Your fingers get pricked by plant thorns.

....

2. Continuous exposing to the contaminated air and noisy places.

....

3. Sitting for long periods in front of the computer.

....

4. Approaching something from your eye.

....

5. The over intake of stimulating materials such as tea and coffee.

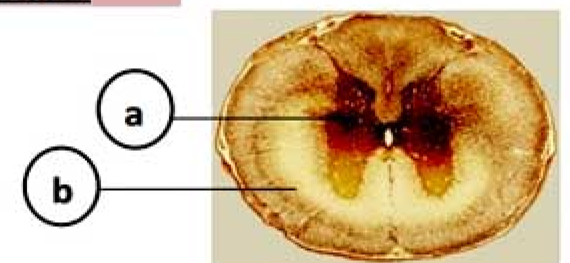
....

Mention the importance of?

1. Medulla oblongata: ....
2. The skull: ....
3. Cerebellum: ....
4. Spinal cord: ....
5. Two hemispheres: ....

Observe the opposite figure, then complete:

1. This figure represents……………………
2. Label the figure:
   (a) …………………
   (b) …………………
3. What is the function of this organ?



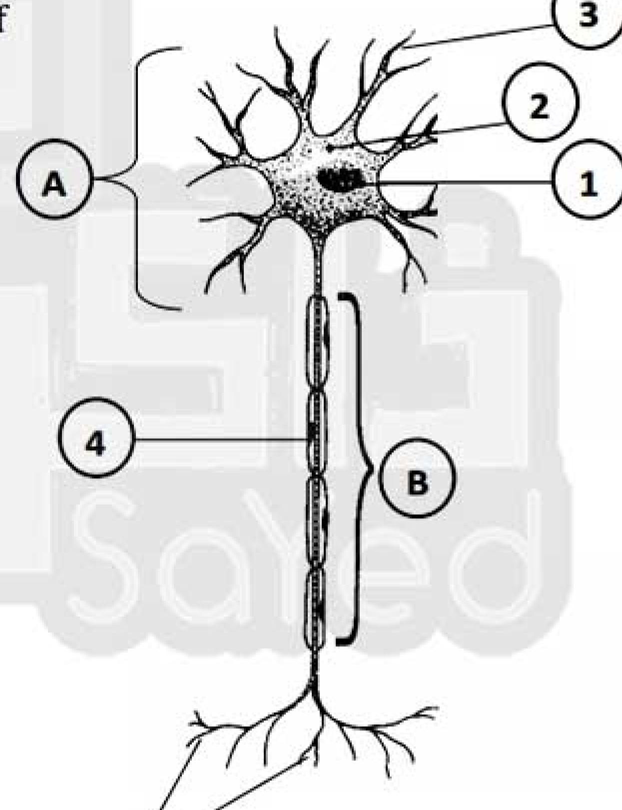
………………………………………………………………………………………………………

Look at the opposite figure and answer the following questions:

1. This figure indicates the structure of
………………………………………………………

2. Complete:
-Part (A) represents the…………………
-Part (B) represents the…………………

3. Write the labels:
(1)…………………
(2)…………………
(3)…………………
(4)…………………
(5)…………………





Choose the correct answer:

1. The building unit of the nervous system is the ....
   a) neuron b) axon c) synapse d) myelin sheath

2. The branches extending from the nerve cell body are known as.......
   a) Axons b) synapses c) dendrites d) myelin sheath

3. The nerve cell consists of..........
   a) Nucleus b) cytoplasm c) plasma membrane d) (a),(b) and (c)

4. One of the components of the nerve cell body is the..........
   a) myelin sheath b) synapse c) dendrites d) axon
5. The central nervous system consists of.........
   a) Brain b) spinal cord c) skull d) (a) and (b)

6. All of the following are from the components of the brain except......
   a) Cerebrum b) medulla oblongata c) spinal nerves d) cerebellum

7. The............is responsible for protection of the brain.
   a) vertebral column b) skull c) hemispheres d) spinal cord

8. The...........is the largest part of the brain.
   a) Skull b) cerebellum c) cerebrum d) spinal cord

9. Which of the following is responsible for keeping the body balance?
   a) medulla oblongata b) cerebrum c) spinal cord d) cerebellum

10. ....connects the brain with the spinal cord.
    a) cerebellum b) cerebrum c) medulla oblongata d) axon

11. The centers of thinking and memory lie in……….

a)medulla oblongata b)spinal cord c)cerebellum d) two hemispheres

12. The cerebellum is responsible for……

a) thinking and memory b) body balance c) reflexes d) (a) and (c)

13. Regulating the movements and functions of the digestive system is from the functions of the………

a) cerebrum b) cerebellum c) medulla oblongata d) spinal cord

14. The spinal cord is located within a channel inside the…….

a) skull b) vertebral column c) cerebral cortex d) no correct answer

15. ……….is responsible for the transfer of nerve messages from different body parts to the brain and vice versa.

a) cerebellum b) vertebral column c)medulla oblongata d)spinal cord

16. ………..controls reflex actions.

a) spinal cord b) cerebellum c) cerebrum b) brain

17. The grey matter in the spinal cord appears in the shape of letter……

a) H b) Y c) F d) A

18. The number of cranial nerves is………pairs of nerves.

a) 31 b) 21 c) 12 d) 43

19. There are……….pairs of spinal nerves.

a) 31 b) 12 c) 43 d) 32

20. The automatic response of the body to different stimuli is known as……

a) axon b) dendrites c) reflex action d) myelin sheath



Lesson Two:

The Human locomotory system



-Movement is the ability of the organism to change its position from a place to another.

-Man moves from a place to another seeking for benefit or away from harm.

-The movement of our bodies depends on the work of muscles and bones together.



The human locomotory system consists of two major systems:

1. **The skeletal system**
2. **The muscular system**

First: The skeletal system

- The human skeletal system
  - The axial skeleton
    - Skull
    - Vertebral column
  - The appendicular skeleton
    - Lower limbs
    - Upper limbs

Axial skeletal system

Appendicular skeletal system



1. The axial skeletal system:

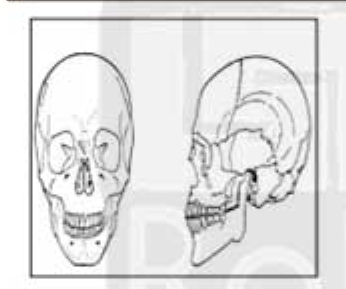
The axial skeletal system

The Skull

It is a **bony box** that contains cavities for the eyes, ears and nose

The function:

It protects the brain.



The backbone

The vertebral column

Is consists of a series of **33 vertebrae**

- It contains **cartilage** to prevent the friction between the vertebrae during movement

The function:

1.It allows the body to bend in all directions.

2.It protects the spinal cord.



The Rib cage

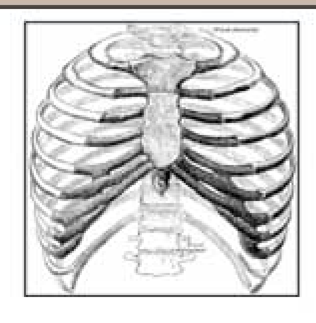
It consists of a series of **12 pairs of ribs**

- The first 10 pairs are connected anteriorly to the **sternum** (breastbone)
- The last 2 rib pairs are loose and not attached so, they are called **Floating ribs**

The function:

1.It protects the heart and lungs.

2.It helps in the respiration process (breathing)

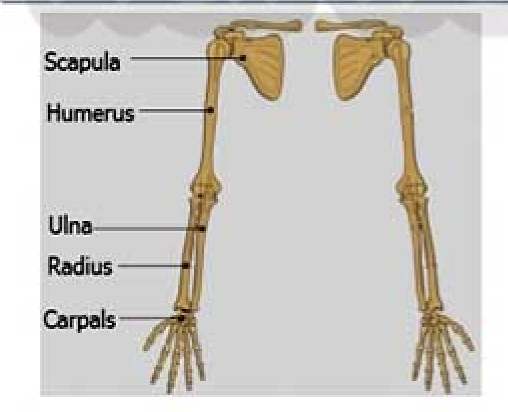


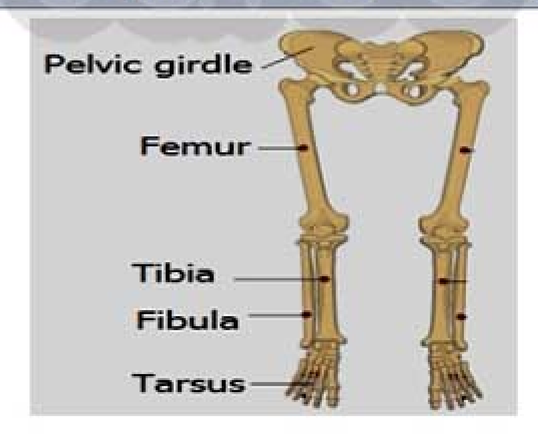


2. The appendicular skeleton:

The appendicular skeleton

Bones of upper limbs	**Bones of lower limbs**
1. Humerus bone **2. Forearm bones (radis and ulna)** **3. Hand bones**	**1. Femur bone** **2. Shafy bones (tibia and fibula)** **3. Foot bones**
-They are connected to the shoulder bones.	-They are connected to the pelvic bones.
The function: 1. Allow eating & drinking 2. Allow writing and holding things.	**The function:** 1. Allow walking, running, Standing up & Sitting down. 2. Carrying the rest of the body.







Joints and their significance to movement

- Human can't move if all of his bones are fused together.

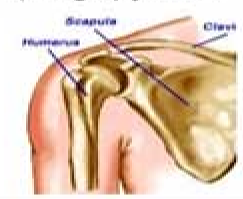
-All the joints of the body allow the movement between the bones.

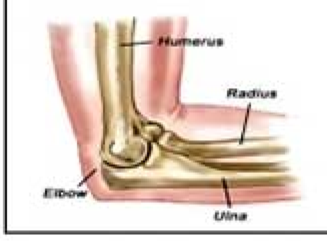
The joint:

- It is the point of connection between the bones.

Types of joints

Freely movable joints	Limited movable joints (slightly)	Immovable joints
They allow movement in all directions	They allow movement in one direction only.	They don't allow any movement.
Example:	**Example:**	**Example:**
• The shoulder joint. • Wrist bone. • The hip (thigh) joint.	• The elbow joint. • The knee joint.	• The joints between the skull bones.





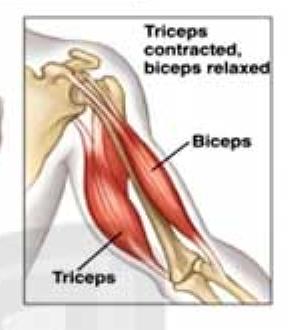


The role of the muscles in performing movement:

-Our muscular system is considered the engine of our body.

-Muscles generate mechanical energy and movement to the body due to <u>the ability of muscular cells to contract and relax.</u>

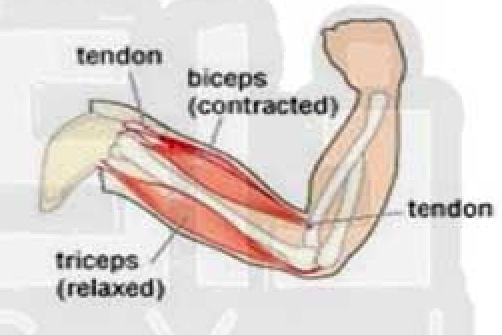




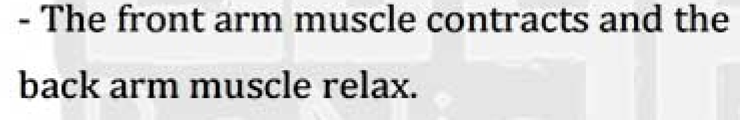
The role of the muscles in the locomotion of the fore arm

There are 2 types of muscles that help in the movement of the fore limbs they are; **Biceps** and **triceps**.

The arm moves in two steps:



- The front arm muscle contracts and the back arm muscle relax.
- The fore arm moves up.





- The front arm muscle relax and the back arm muscle contract.

-The fore arm moves down.



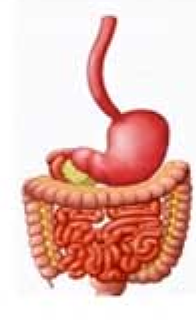
Muscles are fixed to bones by long strips called **tendons.**

Tendon:

A ligament fixes muscles to bones.

- ❖ When the muscles contract and relax, they move the bones.
- ❖ Tendons link between muscles and bones.

Types of muscles:

Voluntary muscles	Involuntary muscles
- They are the muscles which move willingly and you can control its movement. **Example:** 1- The limbs muscles. 2- Trunk muscles. 3- Face muscles 4- Abdominal wall muscles. 	- They are the muscles that work automatically and you can't control their movements. **Example:** 1- The gastrointestinal tract. 2-The blood vessels. 3- The urinary bladder. 



How can you maintain your locomotory system



1) Commitment on vaccinating children according to Ministry of Health's instructions as well as giving children polio vaccinations at accurate times.

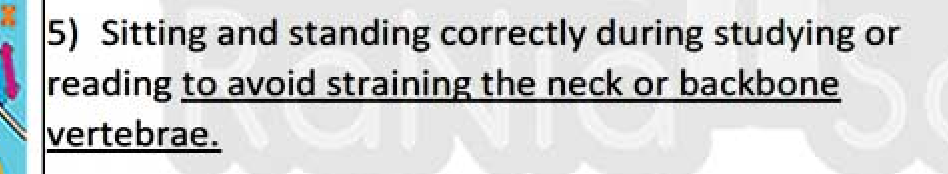


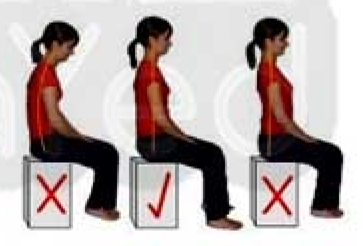
2) Eating healthy food rich in calcium, phosphorus and vitamin D to prevent bone diseases such as steomalacia and rickets.



3) Avoiding any behavior that leads to fractures and sprains such as jumping from high places and making violent movements.

4) Avoid carrying heavy things that exceed your ability to protect the skeleton, especially your backbone.





5) Sitting and standing correctly during studying or reading to avoid straining the neck or backbone vertebrae.

6) Exposing the body to sunlight for suitable periods due to the importance of sunlight in providing the body with vitamin D.

7) Exercising regularly.

Exercise on lesson two

Complete the following:

1) The axial skeleton consists of………………….. and ………………………
2) The appendicular skeleton consists of……………………………………….and ……………………………………….
3) ……………… is a bony box which protects the brain.
4) The spinal cord extends through………………………which protects it.
5) The rib cage consists of……………..pair of ribs that protects……………………….and ……………………………
6) The vertebral column consists of……………………vertebrae.
7) The vertebral column contains……………………. to prevent friction between the bones of the vertebrae.
8) The rib cage attached from behind with…………………and from the front with ………………………
9) The number of pairs of ribs connected anteriorly to the sternum (breastbone) is……………..pairs.
10) The bones of the upper limbs are connected to the backbone through ……………………………
11) The bones of the lower bones are connected to the backbone through ……………………………
12) There are some joints widely movable such as……………………
13) There are some joints limited movable such as…………………
14) Some joints are immovable such as……………………

Write the scientific term:

1. A bony box that protects the brain.	
2. A series of vertebrae enables the human to bend in all directions.	
3. Structure which consists of skull, backbone and rib cage.	
4. The axis of the skeleton in the human body.	
5. The skeleton which includes the bones of upper and lower limbs.	
6. Two bones meeting area.	
7. A structure that fixes muscles to bone.	
8. Joints that allow movement in all directions.	
9. Joints that allow movement in one directions only	

Choose the correct answer:

1. Myelin sheath surrounds the.....

a) nerve cell axon b) cerebellum c) spinal cord

2. Reflex action takes place through the.....

a) medulla oblongata b) cerebral hemispheres c) spinal cord

3.The joint in the location of meeting of......

a) two bones b) a muscle with a bone c)two muscles

4. ....are what fix muscles in bones.

a) Tendons b) Joints c) Muscle fibers



5. Skulls joints are........

a) immovable b) slightly movable c) freely movable

6. The number of cranial nerves is ....pairs of nerves.

a) 31 b) 21 c) 12

7. From the involuntary muscles in the human body......muscles.

a) limbs b) urinary bladder c) abdominal wall

8. The grey matter in the spinal cord appears in the shape of letter......

a) H b) F c) A

9.The cerebellum is responsible for......

a) Thinking b) the body's balance c) the reflex

10. One of the components of nerve cell is the presence of......

a) Blood vessels b) cover of myelin c) dendrites

11. ....controls reflex actions

a) Spinal cord b) Cerebellum c) cerebrum

Give reason for each of the following:

1. The skull is an important organ in the skeleton.

....

2. The backbone consists of a series of vertebrae.

....

3. Any damage in the rib cage leads to death.

....

4. Muscles play an important role in human movement.

....



5. Necessity of eating healthy food rich in calcium and phosphorus.

………………………………………………………………………………………………

6. Presence of cartilage between vertebrae of vertebral column.

………………………………………………………………………………………………

What happens if?

1. Hip joint has a limited movement.

………………………………………………………………………………………………

2. The front arm muscle relaxes and the back arm muscle contracts.

………………………………………………………………………………………………

3. There is no cartilage between vertebrae of vertebral column.

………………………………………………………………………………………………